

Airfield Research Group Ltd

ARG Research Note No.56: Air-Raid Precaution

Railway Control Centres

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Front cover: the control room of a Type B2 control centre
Computer generated model by Paul Bellamy

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ABBREVIATIONS

ARP	Air-Raid Precautions
BHQ	Battle Headquarters
CG	Central Force
CLC	Cheshire Lines Committee
COM	Chief Operating Manager
DOS	District Operating Superintendent
DDRT	Deputy Director of Railway Transport
ft	feet
GHQ	General Headquarters
GOC	General Officer Commanding
GP	General Purpose (as in types of bomb)
GPO	General Post Office
GWR	Great Western Railway
HE	High Explosive
HQ	Headquarters
HQHF	Headquarters Home Forces
HG	Home Guard
IDF	Intermediate Distribution Frame
in	inch
LADA	London Air Defence Area
LMS	London Midland & Scottish Railway
LNER	London & North Eastern Railway
LPTB	London Passenger Transport Board
MDF	Main Distribution Frame
MoT	Ministry / Minister of Transport
MoWT	Ministry of War Transport
NE	North-East
NCP	National Car Park
NGR	National Grid Reference
NADA	Northern Air Defence Area
PO	Post Office
REC	Railway Executive Committee
RCO	Railway Control Officer
RTC	Railway Technical Committee
SR	Southern Railway
TNA	The National Archives
VP	Vulnerable Point
WWI	The Great War
WWII	The Second World War

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Plate 1: Interior view of an emergency control presumed to be the Type A1 at Crewe.



Plate 2: Crewe telephone switchboard and supervisor's desk.
Photos: Bob Freshwater

Part 1: Introduction and Notes on Sources

1.1 Introduction

This report was commissioned by English Heritage in order to have a better understanding of twentieth century railway control centres in England. The document builds on research and a survey completed on the Chester District type A2 Railway Control Centre located at NGR: SJ 41388 66872 which was demolished during March 2014. The original report on this building is included here as a test case.

The content is based on primary sources preserved at the National Archives (TNA), Kew, and the National Railway Museum (Search Engine) archives at York, as well as contemporary secondary sources retained at the Airfield Research Group's archives at Alconbury airfield.

1.2 Limitations

The subject matter is limited in depth to just one aspect of railway Air-Raid Precautions (ARP) of the First and Second World Wars as well as the Civil Defence of the Cold War. Other aspects of ARP, such as air-raid shelters, electric sub-stations and the protection of signal boxes are covered by way of context and in superficial detail. Others such as central switching, decentralisation of stores, docks and harbours, repair of viaducts and bridges, mobile repair gangs and the disused railway tunnel surveys of the 1970s are not included. There is scope for further work, examining the full planning and implementation of ARP and Civil Defence schemes for all three periods and how these changed over time. There are many primary sources preserved in the National Archives and the National Railway Museum in support of this, but they appear to be limited in any detail to only one or two companies during the wartime period and to just one British Rail region in the Cold War.

1.3 Notes on Primary Sources

There is very little to be found in The National Archives on the emergency operation, defence, or air-raid precautions specifically on the railways during the First World War, apart from those that relate to a potential enemy invasion of East Anglia and the UK-wide air-raid warning organisation – there are many aspects to this, covering several organisations, including local government, the police and fire service. A thorough study of this topic is therefore beyond the scope of this report. As far as it can be reasonably established, there were no new-build buildings designed and constructed on the railways in support of the conflict, the only shelters being adapted from existing basements, railway arches, plus the London underground network.

Without doubt, the definitive published work on the First World War with regard to the railway network is *British Railways and the Great War*, by EA Pratt, published by Selwyn and Blount Ltd, 1921.

There is a large number of primary sources on Britain's Second World War wartime railways, preserved at TNA particularly within the following letter codes:

- British Transport Historical Records (ZLIB)
- British Transport Commission: Railway Executive Committee and the Railway Technical Committee files (AN)
- Pre-Nationalisation Railway Companies: Railway Staff Conference minutes (RAIL)
- Ministry of Transport (MT).

The files relating to emergency control rooms for use during the Second World War, mainly but not exclusively, can be found in searches under ARP within the letter code AN, and division number 2 (AN2) such as AN 2/8: *Emergency Arrangements – Shelters*, this is a large file containing AN2/8/1 to AN2/8/30 and covers many aspects of air-raid shelters on the railways.

A search was also made on the Network Rail Archive which revealed three original LMS drawings of the Second World War railway control centres, plus another post-war drawing for the building at Knebworth; searches for drawings of Southern Railway company HQ and emergency control centres proved fruitless.

Finding specific files or data on Second World War emergency control rooms has proved a challenge due to the complex subject of ARP and often, poorly-titled file names. They are also repetitive, contradictory and very often incomplete, with attached sketches and drawings missing. Some of the files within AN2 are mixed company files, others relate to estimates rather than factual accounts, but the bulk of material describing the design of emergency control rooms comes from the LMS official wartime histories (RAIL 418/197– 201) but even here there are very few files relating to the headquarters at The Grove, Watford. As far as other companies go, there is also very little other than general monthly progress reports, estimates and almost nothing on the Southern Railway headquarters at Deepdene. The most complete files relating to buildings of this type come from the Railway Technical Committee. There is also an unacceptable level of inconsistencies within the primary sources with regard to the title given to these buildings which seem to vary from battle headquarters, admin and control centre, control room, control shelter, control office; sometimes the word ‘emergency’ is included at the beginning of the title.

Files relating to the defence of the railways in the Cold War preserved at TNA are mainly associated with estimates for proposed works, either relating to the decentralisation of the emergency control rooms, or for the mobile control rooms of all six regions. There are very few documents describing the actual planning, design and construction of either of these types and almost none covering the operational period (if there ever was one) or exercises to prove that the system worked, or relating to closure and the decision to abandon the controls.

The National Railway Museum at York has a significant collection of plans and documents on Civil Defence and emergency control rooms from the early 1950s to the mid-1960s, covering the British Rail Eastern Region. These records were discovered, locked in a large trunk, during redevelopment work at King's Cross station, London in 2010. The records complement those preserved at TNA, and while there is some duplication, the bulk of it is unique and most importantly includes the 1948 and 1952 surveys of

- The region's stock of air-raid shelters
- ARP modified and purpose-built signal boxes
- Set of plans and detail drawings of the Type ‘L’ control centre and its predecessor the Type ‘H’.

Another important archive at NRM, includes the company staff journals published until 1947 and the Railway Gazette.

1.4 Primary Published Sources

There is very little in the way of secondary source published material on the actual buildings, either those constructed for the Second World War, or for the Cold War – but because the protected shelters were constructed to foreign and British Government published standards, an excellent source of data on this type of building, as far as design and construction is concerned, can be found in the pre-war and wartime handbooks published by HMSO. These cover all aspects of Air-Raid Precautions and also include pamphlets, memoranda and circulars of which there were hundreds. Most of the pre-war architect journals – including RIBA Journal, National Builder, Municipal and County Engineers and Builder – published very detailed accounts of the design and construction of air-raid shelters. Private firms involved in the manufacturing of ARP equipment published pamphlets and brochures on a multitude of subjects from gas cape coat hangers, to ventilation plant. One of the best books on air-raid shelters is the GW Glover book, ‘*Civil Defence*’, published by Chapman & Hall (1938) and Chemical Publishing Co Inc (1941).

1.5 Secondary Published Sources

Perhaps the best account of the railways during the Second World War in recent times, is LG Warburton's excellent book, ‘*Wartime LMS*’ published by Noodle Books (2012); it has three plans depicting types A1, A2 and B2 control rooms – the book being based on the official operating companies' wartime reports found in TNA under RAIL 418/197 to 201.

An article in the Great Eastern Journal (#102, April 2000) by Ted Summerfield LNER ‘*Whitegates’ Shenfield – LNER Emergency Control Centre*’, is another excellent account.

The following web sites were consulted:

http://www.samhallas.co.uk/railway/gec_gallery/index.htm

<http://www.lnerca.com/controltrains.html>

Given that it appears that many of these structures have been demolished, there are (as far as we can tell), no archaeological reports available, either online or in archives, relating to building recording of structures of this type. There is an SCC Archaeological Unit's 32-page report of a building survey of the former railway telephone exchange at Dock House, Southampton (SOU 1027) which is available to view at the Local Studies & Maritime Library, Southampton Central Library in hard copy form only (I have not actually seen this doc).

There are no listed buildings of this type or locally preserved structures. The nearest study that I could find online is a downloadable pdf of a possible submarine pen on a bombing range in the New Forest which appears to have been constructed to a similar standard to the protected emergency control room:

<http://www.newforestww2.org/uploads/publications/61.pdf>

A discussion thread has been added to the Airfield Research Group's online forum (Airfield Information Exchange), and from this it has been ascertained that around six buildings of various types are extant.

<http://www.airfieldinformationexchange.org/community/showthread.php?12062-Railway-District-Emergency-Control-Centres>



Plate 3: Peacetime Divisional Control Room, passenger transport section, Crewe c.1949

Photo: Bob Freshwater



Plate 4: Crewe Divisional Control Room c.1949



Plate 5: Crewe Divisional Control Room c.1949
Photos: Bob Freshwater

Part 2: First World War

The organisation of home defence during the First World War is a complicated subject and is remarkably similar, but on a lesser scale, to what later developed in the 1930s in preparation for the next conflict. As far as can be reasonably understood, it did not involve any new buildings on the railways for the purposes of emergency control centre defence, other than adapting tunnels and arches. What follows below is an overview of two of the main aspects of the Home Front that directly involved British railways from an operational perspective rather than railway infrastructure.

2.1 Background

The Railway Executive Committee (REC) was formed in November 1912 with the task of preparing for the co-ordination of the effort of the then private railway companies in time of war through their effective nationalisation under government control. Control simply meant that the government could make certain demands on the railways and to secure them as a single system, as one discipline under one administration. This would allow government traffic to move efficiently by any route while avoiding conflicts of interest under divided ownership. All working details and all responsibilities of administration was the responsibility of the REC.

The declaration of war between Britain and Germany came at 11 pm on 4 August 1914 and on the same day the Secretary of State for War, Herbert Asquith, served notice under section 16 of the Regulation of Forces Act 1871 allowing the President of the Board of Trade to take control of 130 railways in Great Britain. This left 46 railway companies that were deemed as non-essential and therefore were not required by the government. The vast majority of UK track mileage, equating to 21,546 geographical miles, was taken – when including sidings the figure came to 50,755 miles. The REC had their headquarters at 35 Parliament Street, Westminster, London SW1 and consisted of the general managers of the larger railway companies. In addition to the 1874 Act, Section 4 of the National Defence Act, 1888 gave powers to military or naval officers acting under due authority, to demand priority for the despatch of military or naval traffic.

2.2 Invasion!

As well as the troops stationed in the geographical area of Eastern Command during 1914, which numbered nearly 300,000 men (against a peacetime establishment of only 45,000 men), there was also the separately organised 'Central Force' (CF). This was composed of about nine divisions of the Territorial Force with two Cavalry divisions of Yeomanry and various cyclists units. The CF was organised on a war footing similar to that of the Expeditionary Force, and was commanded by General Sir Ian SM Hamilton. Headquarters was located in the Horse Guards alongside those of Eastern Command and London District.

The CF was divided into three armies with headquarters at Luton Hoo, Bedford and Aldershot. The infantry of the force was distributed roughly north and south through London, while the cavalry and cyclists formed a line of outposts 10 to 20 miles from the coast. The idea was that if an enemy landing took place, the outpost line would retire to certain pre-selected positions where the infantry would be concentrated. Other key reasons for distributing the CF in this way was that it was thought that a landing in the Eastern Counties would be the most likely point of entry of enemy forces.

In the event of an emergency all military movements on the railways would come under the control of the War Office, with some powers delegated to HQ Central Force or other commands as necessary. The General Officers Commanding-in-Chief, Central Force, Northern Command and Scottish Command were responsible for resolving railway movements with the local railway authorities, for the entraining, collection and concentration of their local forces as well as detraining as communicated by the Director of Movements at the War Office.

The railways of East Anglia and the South East before March 1915 for military movement would come under War Office control, the local command structure being Eastern Command and London District, but if an invasion was to occur, then responsibility for the operation of the railways within these two command areas

would transfer to the Central Force. In order to avoid any confusion during an emergency, the railways of East Anglia and the south-east counties were transferred in 1915 to the General Officer Command-in-Chief, Central Force and certain key railway staff were also transferred to the Central Force. Colonel Pringle, Deputy Director of Railway Transport (DDRT), Central Force therefore assumed responsibility (until it was amalgamated with Eastern Command at the end of 1915), for this region of the UK for any unplanned rapid movement of troops of the home defence army; the DDRT would issue instructions to the general managers of railways directly, and his orders had to be acted upon. Colonel Pringle therefore, was the sole authority dealing with the movement of troops, supplies, ambulance trains, armoured trains etc which in the event of hostilities formed part of the home defence force.

The colonel had devised the East Anglia Military Scheme between October and November 1914, which was designed to repel a raid or invasion of East Anglia. The plan was to use the three main line access routes to East Anglia from west to east (Peterborough via March and Ely, Bedford and Cambridge, and via London to Colchester) plus the single-line routes via Huntingdon and Hatfield. Whilst they were of little use for conveying large troop movements, they were to be used for the evacuation of empty rolling stock. It consisted basically of sending a complete Territorial Force Division from Bedford to detrain as close as possible to the point attacked. It would entrain roughly six hours after the receipt of orders to move. Two further divisions were also to entrain at 24-hour notice in the vicinity of Watford and Northampton to reinforce the first division. A regular division from Southampton, Canadians from Salisbury Plain, 20 coast defence battalions from various places, reserve cavalry squadrons, from Longmoor and elsewhere plus three divisions from Scotland and many other units all over the country would be made available to proceed by train if required, either as reinforcements or for the defence of London.

2.3 Home Defence Early Warning System

2.3.1 Early Raid Reporting

Right from the beginning of the war it was regarded as assured certainty that enemy air-raids would be inflicted on the centres of population, and that in order to deal with this threat, the strength of the British defensive air forces would require immediate attention.

The British Air Service consisted on 4 August 1914 of:

- a Naval Wing – known as the Royal Naval Air Service, controlled by the Admiralty
- a Military Wing – known as the Royal Flying Corps, controlled by the War Office
- the Central Flying School.

One of the earliest forms of raid and reporting organisations was a method that had been agreed for the defence of London and this continued well into 1918. It was known as the Metropolitan Observation Service and consisted of a number of observation posts in various parts of London, connected to special telephone lines to a central observation room at County Hall, Spring Gardens. The system was manned by 1,200 civilian volunteers, under the control of Commander Henry Paget, and its purpose was look out for suspicious lights, fires and explosions, resulting from enemy attack.

2.3.2 The Revised System

On 18 June 1915, the Admiralty formally asked the War Office to be relieved from the responsibility for home air defence. The idea was put in abeyance until an agreement could be reached about a demarcation line of responsibility; the Admiralty suggested that the line should be 20 miles inland from the coast, the War Office stated that the coast should be the line that was then accepted by the Admiralty. Under such an arrangement, the whole of the defence over land would be the task of the army. Perhaps one of the most important aspects of the changeover in responsibility for home defence was a revision of the intelligence and warning organisation. The final straw, from which the Government had to take action, took place on the night of 10 February 1916 with the report of a 'Zeppelin', supposedly seen over Scarborough; this sighting had plunged great tracts of the country into darkness and had brought about a widespread cessation of work as far afield as munitions factories in Gloucester. Field Marshal Lord French was asked to prepare urgently a scheme of warnings which would stop the spreading of rumour and of false reports.

The task was given to Lieutenant-Colonel Philip Maud who at once recognised that an efficient warning organisation must be based on the telephone organisation of the country. A conference was called involving representatives from the Post Office, Home Office and the REC; they examined maps of the telephone organisation of Great Britain. It was decided to divide the country into eight (later reduced to seven) warning controls in accordance with the main GPO telephone system, which included England and Wales and the part of Scotland deemed vulnerable to attack. The railway companies operating in England and Welsh areas were divided into three categories:

- Category I: 14 of the largest companies which received at their HQs, air-raid advice directly from the REC: namely Great Central, Great Eastern, Great Northern, Great Western (lines in 18 districts), Lancashire and Yorkshire, London, Brighton and South Coast, London and North Western (lines in 21 districts), London and South Western, Metropolitan (lines in two districts), Metropolitan District, Midland (lines in 24 air-raid districts), Midland (Tilbury), North Eastern and, South Eastern and Chatham
- Category II: 11 companies which received advice from the REC via the HQ of another railway company, for example, Cheshire Lines to be advised by the Midland
- Category III: 23 smaller companies receiving advice through the Post Office telephone exchanges.

On 25 May 1916, the rail and GPO system became operational; each control came under a warning controller who would be based in one of the main centres of the telephone system. The controllers were responsible for collecting and passing on information and for issuing warnings.

For issuing warnings, each control area was sub-divided into 54 numbered warning districts,¹ each one being roughly 30 to 40 miles in all directions covering an irregular shape to fit into the existing GPO telephone network – this meant that a particular district may include parts of more than one county and even one or more train company. Assuming that the average speed of a Zeppelin was just 60 mph, the passage across each district would take roughly half an hour, so districts in the path of the Zeppelin would be warned in succession so that a district only needed to put into effect its precautions at the last moment. The sub-division also ensured that a Zeppelin would always be in the centre of a ‘warned’ area.

The messages sent to the railway companies were of four types:

- ‘Warning Only District No. X’ – a preliminary warning of hostile aircraft
- ‘Take Air-Raid Action District No. Y’ – this would lead to an immediate response throughout the district of a pre-arranged programme of reduction or extinction of lights, the slowing down of trains etc
- ‘Resume Normal Conditions District No. Z’ – was sent when it was considered that the immediate danger which led to the ‘Take Air-Raid Action’ order no longer existed
- ‘All Clear’ – indicated that the conditions that led to the ‘Warning Only’ had passed.

All four messages were sent under military authority, the first being ‘Field Marshall’s Warning’, the second and third as ‘Field Marshall’s Orders’ and the last as ‘Field Marshall’s Notice’. Later these messages were changed to code words namely ‘Green’ for ‘Warning’, ‘Red’ for ‘Take Action’, ‘Yellow’ for ‘Resume Normal Conditions’ and ‘White’ for ‘All Clear’.

The main advantages offered by the railway scheme were two-fold:

- It gave the railways the earliest practical warning, so that they could be prepared; it restricted the taking of air-raid action to just those districts in which the danger had developed and it established a recognised authority from which the railway companies received their instructions.
- The main railways of Britain, having an aggregate of many thousands of stations linked up by railway telegraph or telephone wires to company headquarters and then to the REC, were through the committee able to supply General HQ Home Forces (GHQHF) with information quickly which was then passed on to those responsible for home defence.

¹ Actually 53 as No.20 was not used

2.3.3 Raid Monitoring

At the REC's headquarters, a Post Office telephone expert was on all-night duty at the switchboard, plus three REC staff that slept on the premises with telephones alongside their beds so they could be summoned at a moment's notice. On the wall of the telephone room was a large scale map of England and Wales divided into the 43 air-raid districts (similar to Fig.1) and having on one side columns headed respectively 'Warning', 'Action', 'Resume' and 'All Clear'. These four columns, painted white on a black background, were divided into squares numbered from 54 down to 11 (exclusive of 20) so that chalk could be used to identify which districts were affected by the passage of an airship. A separate chart displayed the times at which HQHF messages were sent to the 14 Category I railway companies.

The Great Eastern devised a method of marking the progress of an attack by hostile aircraft so that they would know the approximate position of the attacking forces so as to give warning to other parts of the system likely to be affected. It consisted of a cork-faced board on which was mounted rows of different coloured pins, together with pins bearing distinctive symbols, a red triangle, a black hexagon with a white circle, a miniature Zeppelin and a miniature aeroplane. A similar board had a series of white headed pins pierced through white labels marked with 5-minute time intervals, (12.05, 12.10 and so on), covering a period of 24 hours. The two boards were kept in the room allotted to the military office at Liverpool Street Station, and placed alongside them was a map of the Great Eastern system on which the numbers of air-raid warning areas were shown.

When news was received from a station master that a raider was in the vicinity of his station, a white-headed pin bearing the time label was stuck to the map over the name of the reporting station. As the raider passed over other parts of the system, so the course taken was plotted by other pins of the same colour but with different time-labels. Similarly other raiders were recorded with different coloured pins, such as red or blue etc. When bombs were reported to have been dropped, the locality was indicated by pin bearing a red triangle or a black hexagon. Should an enemy aircraft be brought down then this was indicated by the appropriate symbol.

2.3.4 GPO System

A warning controller of the GPO system had many sources of information available as to the movements of enemy aircraft, this included a system of observer posts which were set up, based around the largest industrial centres located at a distance of roughly 30 miles from a district boundary, in addition there were coastal observer cordons. The observer posts were manned initially by military personnel who were unfit for service and who were organised into 14 companies of Royal Defence Corps and later by the police, except at a few locations, such as on the coast. Messages were passed to the warning controller who was in telephone contact with the various anti-aircraft defence stations and with GHQ, Home Forces. He also received reports from the police, railway officials as well as army and navy barracks within the control area. In order to avoid confusion when plotting the paths of a flight of a Zeppelin once a raid was in progress, it became necessary to have a method of identification. Each airship as soon as it was seen was given a temporary name by which it could be identified at the various HQs through its flight across the country. Girls' names were reserved for German naval airships and boys' names for military airships (this may not be true of the railway system).

Information was therefore, sent to HQHF via two main routes, either directly by the General Post Office system – priority being obtained by the use of a code word 'Airbandit', or by railway telegraph and telephone to the REC in London. In Scotland it went to the headquarters of the North British Railway Company, and then to the controller concerned, via the London and Edinburgh controls. The advantage of the railway private lines, over the normal GPO lines, was that railway messages could be transmitted very quickly, even over long distances.

The new warning organisation assured at least in theory, that each warning controller received reports of hostile aircraft movements within a few minutes of the observations being made. If the controller judged that the aircraft was approaching his area, he issued the warning message to his telephone exchange manager and he specified by numbers, the districts to which the warning was to be made. The information

was then passed by the telephone operator to the various telephone exchanges in each specified district under threat, and was from there passed to individual subscribers as defined on a 'warning list' in the hands of each telephone operator in the districts concerned. Categories I and II railways were exempted from the list as well as the official warning scheme as the REC issued their own warnings directly to all railway authorities as the railway organisation of the larger companies had been set up so as to be able to do this efficiently, and the dislocation of traffic on the railways would be less if the warnings were centrally controlled.

2.3.5 By Day

Air-raid warnings by day were introduced at the end of June 1917. An experimental Special Day Warning District came into force to include the area east of a line through Norwich, St Albans, Windsor and Worthing and all day warnings were given to this large district as a whole. This came about because hostile aeroplanes flew high and at great speed compared with airships which made the issue of timely warnings to small districts almost impossible. The idea was abandoned by 1 January 1918 because it involved disruption to many districts that the enemy aircraft were not flying over, so warnings of day raids were issued in the same way as for night.

The special arrangement given to the main railway companies was altered on 10 February 1918 and from that date the principal railway companies were included in the exchange warning lists, except for those within the London and Portsmouth districts which continued to be directly warned by the REC. The object of the change was to ensure warnings received by the railways were at the same time as other organisations on the warning lists.

Eventually the warning controls were grouped under two commands:

- London and Portsmouth controls, under the General Officer Commanding (GOC) London Air Defence Area (LADA) who was also known as the Chief Warning Controller, South, and acted as the London controller
- the remaining controls at Birmingham, Leeds, Newcastle and Edinburgh, which collectively came under the GOC, Northern Air Defences Area (NADA) who was also known as the Chief Warning Controller, North and also acted as the Leeds Controller.

2.3.6 Duplication of Essential Equipment

The telegraphic 'nerve centre' of the Great Eastern Railway was situated on the top floor of a wing of Hamilton House, Bishopsgate – a block of buildings, the back wall of which forms a boundary wall of Liverpool Street Station alongside platform 18. On the night of 8 September 1915 much damage was done by an air-raid on the station, falling within 20 to 30 yards of the telegraph rooms. As a result an emergency office duplicating the old one was created in the basement of Hamilton House to be manned only when raiders were reported to be west of Brentford (a distance of 18 miles from the station). This was the pioneer railway 'dug out' in London. Underneath Liverpool Street and the adjoining Great Eastern Hotel are extensive cellars; in one of these, an office was established which was a duplicate of the Great Eastern Military Office. It was provided with a complete set of duplicate telegraphic and telephones. The other cellars became refuges, identified by means of arrows and notice cards.

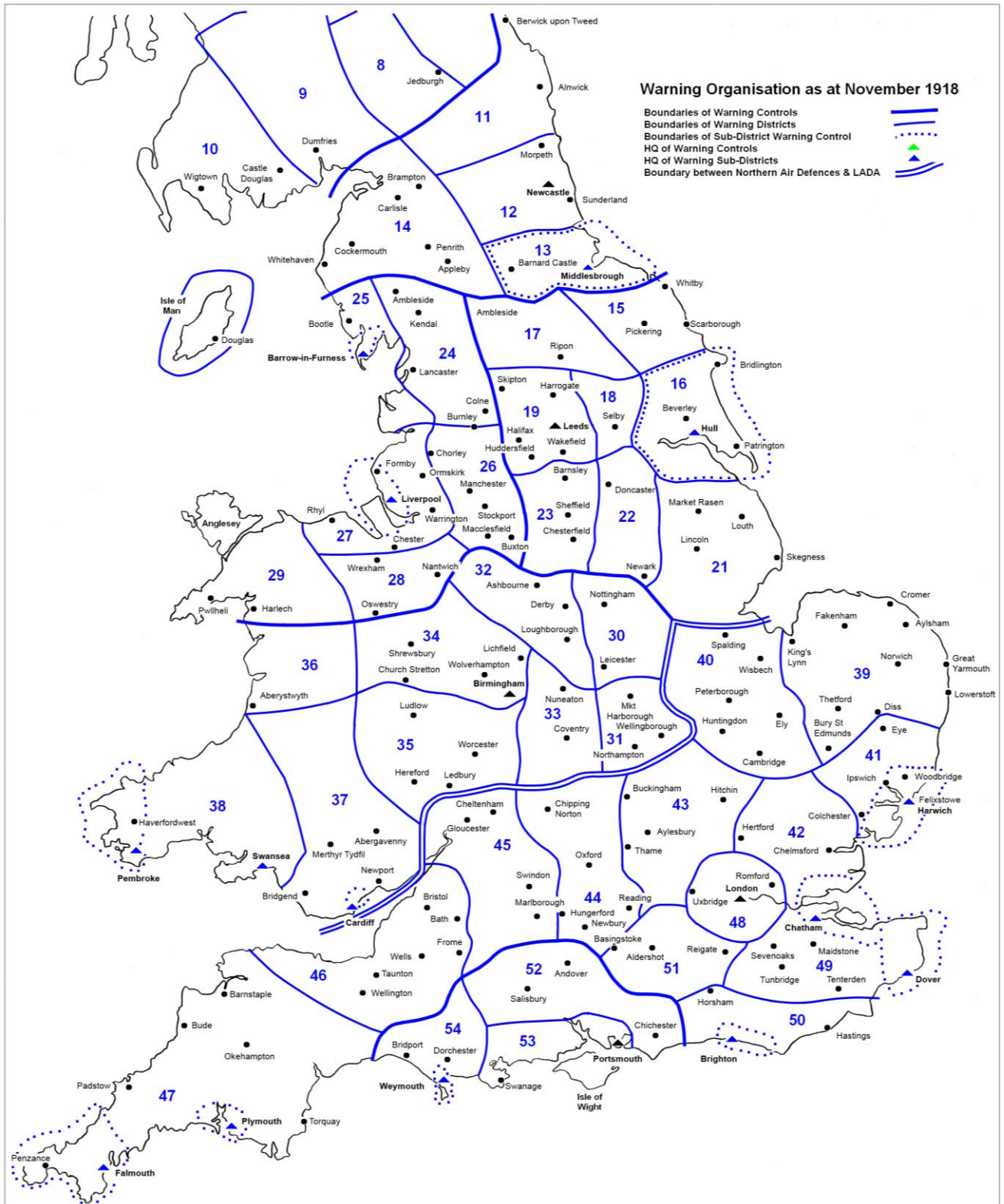


Fig 1: Warning Organisation in England, Wales and the Isle of Man, 1918

It is unknown why area '20' was not allocated, especially as the Isle of Man does not have a number

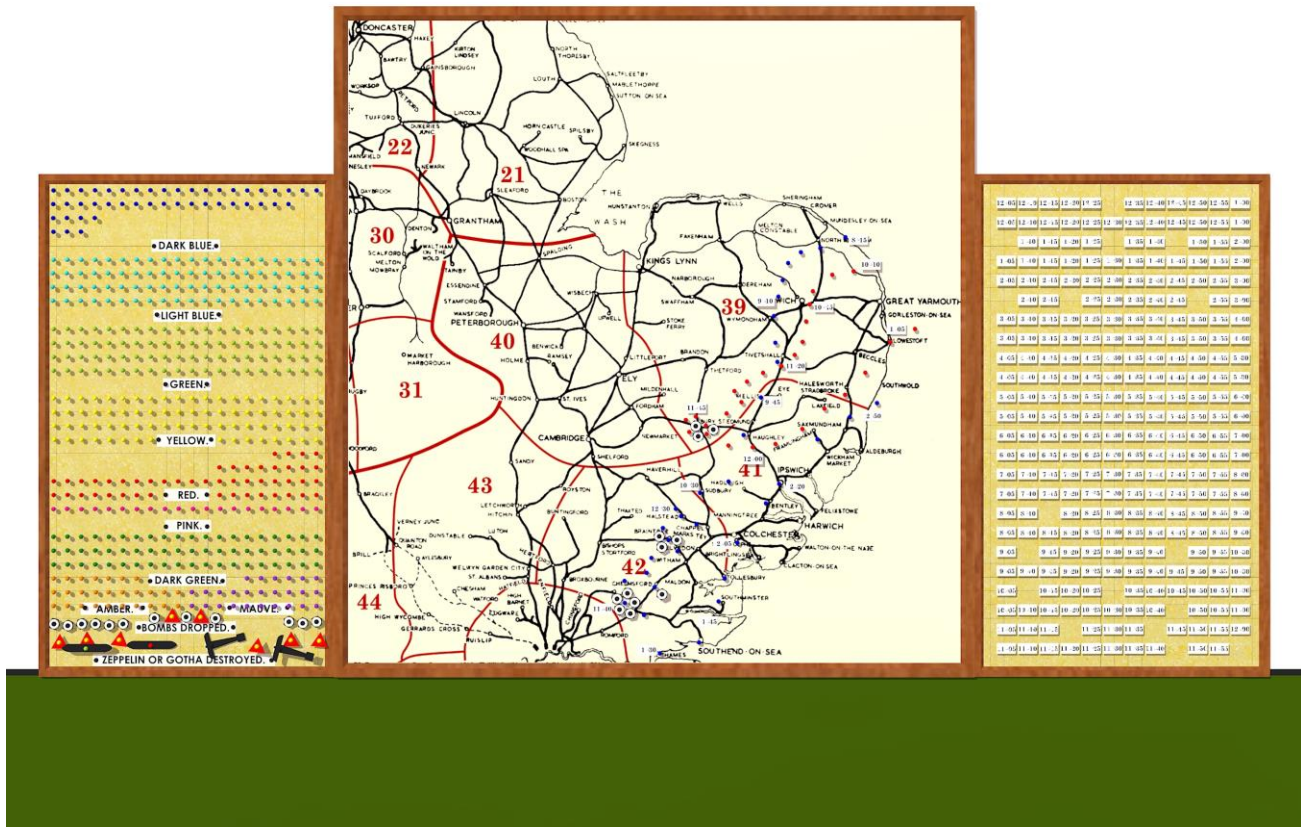


Fig 2: Great Eastern Air-Raid Warning Display Boards at Liverpool Street Station
Computer generated image (presumed – based on British Railways in the Great War)

Known London Area Air-raid Shelters Based on British Railways and the Great War		
Company	Station	Notes
South Eastern and Chatham	London Bridge	Tooley Street Viaduct arches underneath High and Low-Level Stations. New access route cut through arch from Low-Level Station. HQ SE & C Anti-Air-Raid Scheme in one of the large arches, also company military staff offices in smaller arch and a first-aid post within another arch
Great Western	Paddington	Room below the general offices used by company military staff – no shelter
London and South Western	Waterloo	Subterranean passages under the station amounting to 1,500 yards used as air-raid shelters. Company military staff in one of the arches. New sub-way between Bakerloo and Waterloo and City Line used as a first-aid post for 100
London and South Western	Nine Elms	Viaduct arches utilised as an air-raid shelter and first-aid post
London, Brighton and South Coast	London Bridge	Basement and subway air-raid shelter
Great Northern	King's Cross	HQ GNR Anti Air-Raid Scheme conducted from offices protected by sandbags – no shelter. Trains drawn into tunnels until air-raid over. Arches at King's Cross goods yard used as shelter
Great Central	Marylebone	Basement of goods warehouse

Intentionally
Blank

Part 3: Second World War Railway Control

3.1 Control Organisation

The 1939 situation with regard to the day-to-day peacetime operations of a typical LNER or LMS control office was as follows:²

The control room was situated in the named district office; it came under the District Superintendent and Divisional Locomotive Superintendent.

Key personnel manning a control room were responsible for every aspect of railway operation and communication (but not signalling). The aim was to promote the efficient working of the trains within the controlled area (district), and in an emergency to provide a means of making prompt arrangements for the diversion of freight or passenger trains, or taking other steps that may be necessary according to circumstances. The successful operation of a control depended on close co-operation between the trackside staff and control staff. Control collected information from all parts of the controlled area – it kept a log of the movement of trains which were recorded on graph sheets so that the position of all trains was known at all times. It paid particular attention to the following:

- Punctuality of freight and passenger trains
- Prompt removal of traffic
- Best use of available engine power
- Prevention of excessive hours of trainmen
- Distribution of available wagons to the orders of the Freight Rolling Stock Controller.

Control had the authority to:

- Authorise the ordering of special trains and pilots and to cancel trains when possible and desirable
- Authorise procedure being given to one express passenger train over another express train when necessary
- Authorise procedure being given to one freight train over another, or to important freight trains over stopping passenger trains
- Arrange for the diversion or suspension of freight trains and passenger trains when necessary
- Give instructions as directed by the District Superintendent.

The main form of communication was the telephone. Control Selective telephone circuits were only used for 'control' matters, one telephone was provided for each control circuit (York had 7 control circuits and Sunderland 6), each of these being dedicated to selected signal boxes, station master's offices, engine sheds, various inspectors and telegraph offices. Omnibus telephone circuit extensions were non-control circuits between control and selected signal boxes which could also be used by certain unconnected signal, sidings, engine sheds etc that were yet to be connected to the control circuit. For example, if staff working in Annfield Plain Engine Shed wanted to make a call to control, they would have to go to Annfield East Box to make it (Sunderland District). In 1940, York had 14 omnibus circuits and in addition it could communicate by telephone with a further 28 signal boxes and 2 yards that were not connected to the York District Control by telephone via switches at selected signal boxes. It also had direct lines to the district controls at Huddersfield, Hunslet, Leeds and Masborough.

Reports were made to control by telephone or wire by station masters and others in accordance with instructions issued by the District Superintendent. Any serious delay to passenger trains, or any cases where passenger trains entered the controlled area considerably behind their booked schedule, was reported to control. Details of freight trains such as engine number, number or name of the train, whether it involves

² Note that the description may not be correct for the years previously, or after the end of WWII as there appears to have been a different arrangement from 1922 when local controls did not include main lines (which came under Main Line Control). This arrangement was gradually phased out in the late 1930s until October 1939, when the last of the Main Line Controls was disbanded and responsibility for main lines was transferred to the District Controls. Another re-organisation occurred 1945 / 46 – the details of which are unknown.

the up or down train, and (where there was more than one running line), the line on which it was running was also given. Trains were reported as follows:

- When they entered certain selected places
- At all calling places or terminals on arrival and departure
- When shunted from running lines to sidings, or diverted from one running line to another with details of time shunted and time departed, or time travelled
- When stopped at signals – on arrival and departure.

It can be seen therefore, that in wartime if an office was knocked out, traffic within the district would come to a standstill.



Plate 6: Crewe Divisional Control Room c.1949.

Photo: Bob Freshwater

Part 4: Britain's Railways in Wartime

4.1 Aftermath of the First World War

On 26 February 1919, a Bill was presented to Parliament '... to establish a Ministry of Ways and Communications (later called the Ministry of Transport) to whom were to be transferred all the powers and duties of any government department in relation to railways, light railways, tramways, canals, waterways and inland navigation, roads, bridges, ferries, vehicles, harbours and docks'. The Ministry of Transport (MoT) having passed through both Houses of Parliament, received the Royal Assent on 15 August 1919.

On transfer to the new MoT, the transport functions of the Board of Trade effectively closed the functions of the REC as a department of the Board, but it continued to function until a new organisation was set up to replace it on 1 January 1920; this was the Railway Advisory Committee, made up of 12 General Managers and representatives of the workers.

This was followed in 1921 by The Railways Act or 'Grouping Act' which grouped the existing railway companies into four large geographically-based units. The new structure came into operation on 1 January 1923:

- London Midland & Scottish Railway (LMS)
- London & North Eastern Railway (LNER)
- Great Western Railway (GWR).
- Southern Railway (SR).

4.2 Background 1938–40

On 1 September 1939, the government (on behalf of the Ministry of Transport³) took control of the main line companies and other railways under the Emergency (Railway Control) Order, 1939. Back in September 1938, during the Munich Crisis, the Railway Executive Committee (REC) had been formed to act in an advisory capacity to advise the government about the duties of the reformed railway companies in a national emergency. Once the decision had been taken by the government to control the railways, it became an executive body acting on behalf of the Minister for the wartime operation of the railways. The committee closely followed the precedent set in the 1914–18 war, although back then the REC had consisted of an acting chairman and the general managers of the ten leading railway companies and was responsible for well over 100 independent railways.

In 1939, the number under control, was significantly smaller, consisting of the four main line systems and the London Passenger Transport Board, whose general managers now formed the REC. The original committee consisted of:

- Sir Ralph Lewis Wedgewood as Chairman (previous General Manager of LNER)
- Sir James Milne (General Manager of GWR)
- Mr Frank Pick (Chief Executive/Vice Chairman of London Passenger Transport Board)
- Mr Gilbert Savil Szlumper (General Manager of SR)
- Sir William Valentine Wood (later President of LMS)
- Mr Charles E Newton (Chief General Manager LNER)
- Mr G Cole Deacon as Secretary.

³ Later the Ministry of War Transport

Government control transferred the activities of the railways from peacetime to wartime conditions and the function of the REC in time of war and until the Order had been revoked, was as follows:

- The movement within the UK of personnel, equipment, fuel, troops and armament of the three fighting services
- The evacuation of the civil population from London and certain provincial towns to rural areas
- The transfer of personnel and office files of gov departments and foreign embassies from London
- The removal of bed cases from London and certain provisional hospitals to temporary quarters
- The provision of the necessary facilities for dealing with the transfer of shipping from the East Coast to West Coast ports
- Maintain adequate transport services for the movement of coal and raw materials to munitions factories, aircraft works, power stations and other vital industrial units
- Undertake the transportation of vast quantities of perishable and non-perishable foodstuffs to the requirements of the government
- The operation of the railway owned docks and canals on a wartime basis
- The manufacturing facilities of the railway companies would be utilized for the production of munitions and equipment.⁴

4.3 Command and Control

Mr RH Hill was appointed as the first Railway Control Officer (RCO), he was the representative from the Ministry of Transport (MoT) through which government policy was conveyed to the companies.⁵ He informed the REC about the general needs of naval, military, RAF, and munitions traffic declared by the government to be essential and the priority to be given to the various classes of such traffic, and the REC would then give the appropriate instructions to the railway companies concerned. The individual companies were not able to take independent action in matters that affected other companies; such items were referred to the REC, and the REC's conclusions were presented to the RCO and hence to the Ministry of Transport. The REC did not actually run the railways, as it left the internal organisation of each company undisturbed; the REC simply was there to make sure that the railways worked in a unified manner to meet government requirements during wartime.

The committee at first used Fielden House (36 rooms), 10 Great College Street, Westminster – the headquarters of the Railway Companies Association since October 1937 and owned by Lineside Estates Ltd, (the property arm of the LMS). Sleeping quarters were provided at 4 Cowley Street, Westminster (10 rooms), neither of which offered any degree of safety in the event of a direct hit by an enemy bomb or an explosion in the immediate vicinity. The cellar of Fielden House was adapted as an air-raid shelter and telephone exchange. The exchange had lines to the Air Ministry, Admiralty, War Office, Ministry of Transport, the main line stations (Euston, King's Cross, Liverpool Street, Paddington and Waterloo), the offices of London Passenger Transport Board (55 Broadway, 1–2 Regents Park and Cranbourne Chambers), two lines direct to the London GPO trunk exchange and five lines to the nearest PO local exchange.

4.3.1 REC Emergency Headquarters

The wartime REC emergency headquarters was located in a disused underground tube station (Down Street, Mayfair), on five levels. Following refurbishment of Green Park Station and its proximity to Hyde Park Corner Station, Down Street had closed in May 1932. Work on its conversion began in April 1939 – the main contractor being Sir Robert McAlpine & Sons (London) Ltd – and a sub-contractor was the LMS Carriage & Wagon Works who built much of the equipment and furniture. The largest available area was occupied by the old platforms, the sub-ways and connecting passages, the platform spaces being walled off from the railway tracks. Space was therefore severely restricted, with many rooms within the tubes having

⁴ AN 2/96/3 Folios 27-31

⁵ The RCO was not a member of the committee until a re-organisation took place in March 1941

one curved wall (representing a complete portion of a tube). The only part of the complex deemed vulnerable to an air-raid, was the former lift shaft which had been used for tunnel ventilation. With lifts removed it had to be capped with a reinforced concrete slab, and a small passenger lift was installed in the old lift machinery room. The basic parts consisted of the following:

- Ground floor (air-lock and stairwell), basement (stores, stand-by set and stairwell)
- High-level subway (ablutions, stairs and air-locks)
- Low-level subway (wireless reception offices, committee room, typists, offices and air-locks)
- Down and up tunnels of that part which formed the station platforms which were mainly walled off to provide the following: switch room, offices, meeting rooms, mess rooms and dormitories with adjacent stairs to the low-level subway. Small platforms were retained at the western end for committee members (one for each direction) to travel by train, which could be halted by plunger-operated red signals.

The emergency HQ became operational on 3 September 1939 – the day war was declared with Germany but at this date, it was only half finished.

4.4 Air-Raid Precautions RTC – Protection of Control Centre Key Staff

On 3 December 1937, the first meeting of the Air-Raid Precautions Railway Technical Committee (RTC)⁶ was held in the board room at Liverpool Street Station. As a first step it was decided to examine the minimum requirements in the shape of protection which would permit the railway companies to operate essential services in time of emergency. Its main purpose was to secure uniformity in the preparation of schemes of protection. For the purpose of dealing with specific technical questions, it was split into sub-committees, composed of certain committee members and the appropriate technical officers of the railway companies.

At the first meeting, it was agreed that each company should prepare lists for the benefit of the committee to be ready for the next meeting on 29 December, containing information on the following:

- Vital points in the network where diversion would not be possible
- Administrative control rooms requiring protection, including divisional and district headquarters
- Power stations and sub-stations
- Power signal boxes
- Locomotive power depots
- Marshalling yards.

Having regard to the importance of control organisations of the railways, the committee was of the opinion that special protection – and in most cases duplicate skeleton facilities – should be provided for control centres and telephone exchanges. It was then agreed at a subsequent meeting that matters concerning administrative and control rooms should be one of the items to be considered by a sub-committee under the chairmanship of GS Hussey, which included a Home Office representative, Colonel Trench of the MoT and technical representatives of engineers from the five main railway companies. The committee met on ten occasions between December 1937 and June 1938; its purpose was to consider protection that could be afforded to enable the railway companies to carry on the railway service as efficiently as possible in the event of an emergency, which might involve a prolonged period of intermittent aerial bombardment. It examined the problem from three main angles, protection of personnel, protection of vital points, and the additional stocks of material required for emergency repairs.

On 10 February 1938, a list of the various control rooms and telephone exchanges in the vulnerable areas was sent to the Home Office, with the understanding that they would categorise the places shown and would state the measure of protection which the government considered should be afforded to each one. If the railway companies, required a greater degree of protection from that as recommended by the Home Office, then the companies would have to pay for the additional costs.

⁶ Chairman: VM Barrington-Ward, Secretary TS Roberts (MT 6/2730)

By 14 February 1938, the Home Office had presented to the committee its memorandum, outlining the department's decision on the degree of protection to be afforded to railway control rooms and telephone exchanges.

It recommended three levels of protection:

- 1) Bomb-proof protection, either full or protection against a 500-pound semi-armoured-piercing bomb (cover of the order of 15 feet of concrete overhead) or protection against a 500-pound general-purpose bomb (5 feet of concrete overhead). These thicknesses must be disposed to ensure that the bomb strikes a burster layer before striking the roof of the shelter.
- 2) Protection against direct hits by 25-pound incendiary bombs and against the blast and splinters from large high-explosive bombs not less than 50 ft away. Cover in the order of 22 inches (later reduced to 15 inches) of concrete overhead.
- 3) Protection against direct hits by light incendiary bombs and against blast and splinters (5 or 6 inches of concrete overhead).

This type of decentralised control under discussion did not suit GWR and SR as these railways were centrally controlled, which was entirely different from that of the LMS and LNER which operated from locally control circuits. The adoption of decentralisation control on the GWR and SR would require serious disruption to train movements while repairs were made to telephone exchange equipment (the GWR Emergency Trunk Telephone Network was completed by 1 April 1940).

There were other anomalies:

- The LMS, LNER, SR and LPTB wanted to have a limited number of alternative control rooms which were only going to be used during an emergency, while GWR favoured staffing these continuously in times of war.
- The number of men (at first) operating the shelters was estimated to be 12, except for the GWR and SR where larger numbers had been anticipated.

The question of staffing the rooms during a gas attack was also raised and the Home Office representative replied that two hours of occupation would be acceptable. The committee decided that this factor should be taken into account in considering gas risks and the question of air filtration and ventilation in the construction of the shelters. Primary sources regarding air-raid precautions and control rooms state the following:

ARP handbook No.5 recommends that control rooms should be ventilated gas-protected shelters.

The ARP booklet Instructions for the Working of Railways after Attack by Liquid Blister Gas (1942) states that priority for decontamination should be in the following order:

- | | |
|--|---------------------------------|
| 1) Control offices | 6) Marshalling yards |
| 2) Telephone exchanges and telegraph offices | 7) Important Passenger stations |
| 3) Signal boxes | 8) Goods stations |
| 4) Locomotive depots | 9) Other passenger stations |
| 5) Power stations | 10) Carriage sidings. |

It also states that *'internal decontamination will only be required if a gas bomb had penetrated the building'*. This was very unlikely with the control rooms, as structurally they could easily withstand a direct hit from a bomb filled with gas. Any such an attack on a building or in the immediate vicinity would be given top priority in order to prevent vapour from penetrating the building – though this would be improbable if the blast doors had seals. In view of the large amount of labour and materials required for dealing with mustard gas, weathering would have been the main form of decontamination adopted. Small areas like door handles and equipment might be treated with water or paraffin.

The Home Office recommended that protection on the scale set out in level (2) above should be provided; this was the standard being applied by the government to other buildings housing essential staff or essential services such as telephone and repeater stations. Bomb-proof structures (level 1) were not being provided for any organisations of similar importance. Vital railway control rooms outside vulnerable points

should receive the same standard of protection and other buildings outside vulnerable areas should receive the standard set out in level (3). The GWR and SR made it quite clear that the levels of protection in (2) and (3) would not ensure the efficient operation during war time of their railway systems which were controlled centrally by one organisation (respectively). Furthermore, it was vital that these two companies would still be able to serve the southern and western ports, therefore complete bomb-proof and air-conditioned duplicate facilities should be provided in certain cases. These recommendations were put forward for the purposes of preparing plans and estimates. It was presumed that wherever practical, use would be made of existing accommodation and resort to new construction only in exceptional cases.

At the meeting on 18 February 1938, the LPTB had suggested that improvised bomb-proof accommodation in the tube workings for the London operating headquarters of the LMS, LNER and GW companies, this idea was welcomed by the committee and it was suggested that the LPTB should provide a list of lift shafts or other accommodation which might be considered suitable for this purpose. As far as the SR was concerned, it was noted that existing accommodation at Waterloo was available for the provision of adequate protection.

On 2 March 1938, the chairman of the sub-committee submitted a report and this revealed that Home Office officials were now prepared to consider the following standards of protection for vital admin centres, control points and telephone exchanges:

- Concrete shelters providing bomb-proof protection against the general purpose bomb, with a roof thickness of approximately 5 ft, plus
- Incendiary bomb, blast and splinter-proof protection with roof thickness to be specified in the region of 15 inches.

The proviso being that the bomb-proof standard should only apply for high-risk areas. The GWR still felt that air ventilation should be incorporated into the designs, in view of their continuous use in time of war. The provision of air filtration plant was considered unnecessary because the buildings would only be used during an air-raid and that the space required in the shelters would provide sufficient air for personnel to remain in them over six hours. GWR, and in some cases SR, still proposed to man these shelters with a skeleton staff continuously in war time, while other companies would use their existing facilities as long as they were able. The SR did in fact not install gas filtration plant for their underground divisional HQs (on the outbreak of war they were called battle headquarters – BHQ) at Orpington (London East), Redhill (London Central), and Woking (London West) plus above-ground sites at Southampton (Southern) and Exeter (Western) until after March 1942.⁷ Until 1942, the SR BHQs relied on extractor fans which were fitted in January 1940. Gas proofing had been carried out by the company at 22 of its admin and control rooms at a cost of £536 which had been completed by 10 May 1940. Railway telephone trunk lines between the SR GHQ at Deepdene, Dorking and the divisional BHQs had been completed by 6 March 1940.⁸

The officials agreed in March 1938 to submit to the railway companies, specifications for shelters based on these standards and the companies were then required to state which of their buildings would be constructed under the two categories of protection. It is interesting to note, that at this time the Home Office had acquired information and plans provided by the French Government for their railway control points (which may have influenced the change in policy). Level (3) above was adopted for minor store buildings, first-aid posts and other buildings outside vulnerable areas, and later still, in 1940 for LDV / Railway Home Guard small-arms ammunition stores.

It was agreed that accommodation should be provided in the shelters to cover:

Apparatus and equipment

Store rooms

Self-contained electricity unit.

^{7 7} Southampton had been partially destroyed by enemy action, and the Southern Divisional staff had to be temporarily evacuated to Salisbury until a mobile arrangement of coaches stabled at Romsey became available after May 1941. The advantage of the train scheme, being that it could be moved elsewhere should Romsey become untenable.

⁸ Surviving records relating to SR in TNA are by far more extensive than that for the other companies.

The following approximate details were mentioned on 2 March 1938:

- LMS and LNER: Shelters to house 12 men – 41 ft by 23 ft internal
- GWR: Shelters to house 25 men – 60 ft by 40 ft internal
- SR: Details not yet worked out
- LPTB: No new buildings necessary as improvisations could be arranged.

The question of whether the shelters should be constructed above or below ground was also discussed but as some sites would be unsuitable, it was decided that above-ground specifications should be supplied, although certain divisional HQs of the SR went underground, although these are thought to be alternative bunkers used only in emergencies. Staff at these sites were accommodated above ground.

The position with regard to furnishing the emergency control rooms was that, under normal conditions, the full equipment would be used within the existing control rooms, and the 'skeleton' equipment in the shelters would be used during air-raids. It was never practical to furnish the shelters with expensive equipment, such as Creed teleprinters and comprehensive telephone switchboards (except at a few sites such as Crewe, Derby and Manchester Godley) – all of the basic fittings would be surplus to requirements once the war had ended.

Sir Alexander Rouse on behalf of the Home Office agreed to prepare the specifications for the new structures and would supply these to the sub-committee in the following week. Following this the engineers from the various companies would draw up five plans, two bomb-proof and three for incendiary bomb, splinter and blast proof.

On 27 April 1938, came the final specifications from the Home Office and plans were then submitted by the LMS; the committee agreed that this layout was a reasonable one that should be adopted by all companies. Estimates were then prepared for shelters accommodating 25, 12 and 6 staff respectively and these were approved by 8 June 1938:

- GP bomb-proof shelter for 25 and 12 men
- Incendiary bomb, splinter-proof and blast-proof for 25, 12 and 6 men.

On 5 January 1939, the minutes of a RTC meeting that took place at Fielden House, were issued, with a recommendation that the following ARP estimates should be made available to the railway companies for the projects outlined below, (note that this estimate differs from one prepared on 8 June 1938).

Allocation of ARP Expenditure (£ thousand)	LMS	LNER	GW	SR	Total
Administration and Control Rooms	267.6	199.6	110	130.1	707.3
Signal Boxes	245	112.7	81.7	80	519.4
Power Stations and Sub-Stations	73	10	6	41	130
Civil Engineer Emergency Stores (3 month's supply)	119	78	61	60	318
Signal and Telegraph (12 month's supply)	317	205.5	118	101.5	742
Engineering Emergency Stores (3 month's supply of loco spare parts)	140	Nil	Nil	Nil	140
Lighting Restrictions	85	70	45	50	250
Extra Protection for Essential Staff (at certain vital yards and depots)	113	88.5	50.6	34.35	286.55
Twelve 35-ton steam breakdown cranes	N/A				120
Welding and Burning Plant					10
Emergency Telephone Connections with GPO Circuits					25
Improved Hydraulic Power Plant at Brentford Docks					1.75
Grand Total £3.25 million					

On 13 April 1939, the Railway Control Officer (RH Hill) wrote to the Secretary of the Railway Companies' Association at Fielden House. Amongst many points raised, and in connection with admin and control rooms, he stated that apart from certain items of furniture, all expenditure so far submitted has been approved (item 2). In item 4, under extra protection for essential staff at vital points, he stated that the Minister was prepared to approve certain works provided that it is used to reduce to a minimum any interruption of essential duties.

4.5 Air-Raid Precautions

4.5.1 Introduction

Note: this section is mainly but not exclusively concerned with the LMS.

On 3 January 1939, the Minister of Transport wrote to the operating railway companies outlining their responsibilities with regard to Air Raid Precautions (ARP). They should carry out 'good employer' protection at their own cost. Official discussions on ARP for the railways had been going on throughout the 1930s, and at the end of 1937, an RTC panel of experts put together a comprehensive scheme for precautions at a cost of £5.2 million, of which £1.2 million would be for the protection of railway staff – the cost of which would be met by the railway companies. This included providing sandbags, the training of staff in anti-gas measures, first-aid and decontamination and basic firefighting, also to provide the equipment and materials to carry out the training and provide respirators for its entire staff. During 1938, nothing was done to put these proposals into effect and it was quite some time before the Treasury could be induced into agreeing to pay the whole cost of ARP for the railways. Both the Treasury and the Home Office wanted to treat the railways as public utilities, which would pay one half themselves, while the government paid the other half. The MoT on the other hand, accepted the view that the railways ought to be treated as a special case and given more generous help as, it was argued, they would be the government's responsibility in time of war. After prolonged discussion, the Treasury agreed to the MoT's proposals, and by the end of 1938, the government had undertaken to bear the cost of ARP measures except for 'good employer precautions'.⁹

The RTC had compiled a report on 22 June 1938, of certain measures that would be required in the event of war; one of these was the provision of emergency telephone connections with GPO circuits. This and other measures that fell outside the scope of good employer precautions, was sanctioned by the MoT on 3 January 1939. These included emergency repair stores for signalling and telegraphing equipment.

The Treasury agreed to pay an amount not exceeding £4 million and this would be made available in addition to the agreed good employer precautions (there were certain conditions that had to be complied with).

4.5.2 Air-Raid Shelters

General protection for railway staff would be provided by concrete or steel lined trenches or above-ground air-raid shelters, constructed with reference to ARP Handbook No.6, with particular regard to pages 13–17. Splinter protection was considered as more important than protection against gas. The 1939 adopted shelters were as follows:

- Type 'A': pre-cast concrete arched-shaped shelters (4 in thick) covered with 2 ft 6 in of earth
Seating capacity 50 persons – estimated cost £300
- Type 'B': rectangular-shaped concrete shuttering (concrete 15 in thick with concrete slab roof) –
Seating capacity 50 persons – estimated cost £400
- Type 'B' Variant – 13.5 in brick walls divided into compartments with sleeper roof and concrete slab over. Seating capacity 50 persons
- Type 'B' Variant – 13.5 in brick or concrete block walls with concrete slab roof
- 'Lewisarch' – semi-sunk steel shelter covered with earth. Capacity 50 persons
- 'Summers' Shelter – underground Nissen-like corrugated asbestos shelter with brick entrance and concrete steps. Capacity 50 persons.

In theory any length of air-raid shelter could be erected, though 50-man shelters were deemed as the most comfortable for the occupants. The estimated cost per foot was £5.12.6d for type 'A' and £6 for type 'B'. With regards to decontamination centres, first-aid and fire posts, it is thought that station lavatories and staff wash and rest rooms were considered sufficient. It was completely impractical for LMS to undertake

⁹ Under Section 23 of the Civil Defence Act 1939, all industrial and commercial concerns that employed more than 30 persons were required to ensure that there were adequate personnel trained and equipped in first-aid and anti-gas measures

ARP schemes initially for every depot, yard, station etc throughout the system, so it was decided to adopt the idea of 'sample schemes'. Complete ARP schemes were prepared for each of these sites by type and all other schemes at other sites of a similar nature were based on the 1938 sample which was based on ARP Handbook No.6.¹⁰

Ground floors of signal boxes and pits of locomotive sheds were also scheduled as air-raid shelters. Wherever possible, all offices and rooms could be protected against gas by simple means such as sealing up the majority of windows with paper and gum. Main entrances were fitted with gas-locks, while other doors were closed and made gas-tight. In the main staff would depend principally on wearing respirators. Existing lavatories were to be adapted as cleansing centres.



Plate 7: View from Spital Bridge, Peterborough showing a monolithic concrete LMS style air-raid shelter entrance
The entrance on the left embankment was one of two to a semi-underground air-raid shelter which was 76 ft long. Photo: Dr. BWL Brooksbank

A memorandum was issued which had set out the general principles to be followed in providing protection for personnel. This was based largely on the Home Office representatives' advice that splinter-proof shelters would be a more important consideration than gas-protected shelters. They also advised that the shelters would only need to be occupied for around a quarter-of-an-hour at a time and so air conditioning would not be necessary. The numbers to be accommodated in a shelter should be based on one person to a minimum of six square feet of floor space. The estimates under protection of personnel, at a cost of £3 or £3.10s per head were as follows:

LPTB: £52,500 (£3.10s)	LMS: £675,000 (£3)	LNER: £527,000 (£3)
GWR: £301,900 (£3)	SR: £204,000 (£3).	

¹⁰ Typically, schemes were prepared for the following samples: docks, goods depots, motive power depots, signal boxes, traffic yards, carriage sheds, wagon repair shops, passenger stations, large works, electric power stations, hotels, permanent way districts.

4.5.3 Protection of Vital Points

At the request of the Home Office, the committee provided a complete schedule of vital points under the following headings:

- Active Anti-Aircraft Defences – physical severance points, junction areas, bridges, and viaducts – where reasonable diversion was not practical and repair or replacement would present special difficulty
- Passive Protection for Plant and Personnel – admin centres, control centres, telephone exchanges, signal boxes, power stations, sub-stations, marshalling yards and locomotive depots – where it would be necessary to give protection to essential staff.

An amendment followed where the number of VPs was reduced to 29 junction areas and 51 bridges and viaducts, which were classified 'A' or 'B'.

4.5.1 Changeover from Normal to Wartime Conditions

On 1 September 1939, two days before Britain declared war on Germany, several precautionary measures took place including Government Control of the railways, a commencement of the evacuation of London and the large centres, and the enforcement of lighting restrictions, which became to be known as the 'blackout'. Eleven days later the wartime timetable was brought into force, giving a much-reduced service at slower speeds.

4.5.2 The Effect of War on the Operating Department Organisation

The collapse of France had necessitated a re-orientation of outlook in connection with the operation of the railway with due regard for the danger which was considered to be imminent from the landing of German parachutists in Britain. This involved with the compilation and issue of a series of railway operational regulations to ensure the safety of railway traffic operation, the prompt reporting of enemy landings and to prevent railway equipment from falling into the hands of the enemy. The Army had requested that signalmen could act as lookouts for hostile troops by reason of their location in elevated signal boxes in all part of the country, and the availability of control telephone system, by means of which reports could be transmitted quickly to station masters and District Control Officers, who were prepared to notify the military authorities.

The military authorities also made use of the network of telephones, especially during the period of co-ordinating the 1940 hardened defences of Britain and in the initial stages of setting up a military communications network. Military officers and NCOs were authorised to use the railway telephones in signal boxes for sending urgent messages to the military authorities, via the railway control offices.

4.5.3 Air-Raid Warning System

For warning purposes the country was divided initially into 109 areas, but later increased to 147 by reducing the size of some of the larger districts. The object of this re-arrangement was to limit the circulation of the messages and warnings to the localities immediately affected. The LMS decided that within its organisation the main dissemination should be done through the control offices as these radiated communication circuits connecting all stations, yards, signal boxes and depots throughout the system.

An agreement was reached with the GPO that the warnings should be received at the company's telephone exchanges and passed by them to the control offices for general dissemination; where no telephone exchange existed, the warnings went straight to the control office. The priority for receiving the warning from control was all places at which exempted (Category 'C') lighting had been installed – the other standard authorised for external lighting for use on the railways was Category 'B' (Fully Restricted).

In the summer of 1940 it was found that the issue of a 'Red' Warning in all cases of the approach of enemy aircraft caused extensive stoppage in both industry and transport, and a meeting took place at the MoT in July of that year to discuss the situation in depth. The main difficulty was the existence of the Cat 'C' lighting, as in the absence of a Red Warning this lighting remained in operation and formed a conspicuous target in the general black-out, thus exposing railway staff to the risk of bombing. This difficulty was

overcome with by the introduction of a new signal termed the Purple Lights Warning. This warning was not circulated to the public, only to authorities such as the railways who were permitted to use Cat 'C' lighting. On its receipt, or receipt of a Red Warning all lighting was extinguished. From 25 July 1940, the warnings consisted of:

- Air Raid Message 'Yellow': Preliminary Caution
- Air-Raid Warning 'Purple': Lights Warning
- Air-Raid Warning 'Red': Action Warning
- Air-Raid Warning 'White': Raiders Passed.

The 'White' message was used cancelled the 'Red', Yellow' and Purple messages. With the introduction of the 'Purple' Warning, the 'Red' Warning was only issued in cases where RAF Fighter Command had reason to anticipate a serious attack. The 'Yellow' message was discontinued in October 1941.

The LMS operating department at The Grove, Watford, received information via teleprinter regarding air-raid warnings and this data was plotted by means of small yellow, purple and red flags onto a large map which showed the air-raid warning areas of the UK. Another map depicted the past 24 hours and this indicated all Purple and Red Warnings of that period (purple and red circles). Damage to company property was shown as a star.

4.5.4 The Aftermath of the Destruction of two Control Offices 1940

a) Birmingham

The first raids on the Birmingham / Coventry / Wolverhampton area commenced on the nights of 25 and 26 August 1940 and were fairly heavy. Then there was a lull until the night of 12 October, followed by 14, 19 and 22 November which concentrated on Coventry. On 28 October a raid on Birmingham New Street Station, resulted the destruction of the District Control Office, the District Passenger Manager's office and the parcels office.

Work was carried on in the emergency shelter at Birmingham and a new office was built on the ruins of the old one. The war and its destruction had a material effect on the design of the new office, based on an examination of the maximum requirements for efficient working – a simplicity of lay-out was achieved which became the standard for new-build control offices

b) Manchester

This city had its first major raid on 22 December 1940, followed by another the next day involving 171 aircraft when damage occurred at 16 places on LMS property, the most serious being in the vicinity of Victoria Station. At 23.45 there was a violent explosion from several HE bombs alongside No.16 platform, and all buildings on Nos.14 to 17 platforms were either destroyed or extensively damaged. Considerable difficulty was experienced in dealing with the fires owing to the mains water failing. The damage included the total destruction of the Divisional Control offices and many of the Divisional Superintendent's offices. The Emergency Divisional Control office, which had been provided for such an event, was flooded and the control communication telephone network put out of action, necessitating a hurriedly improvised control office being provided in the cellars under Hunt's Bank offices. At nearby Heaton Norris, the District Control office was also damaged and had to be vacated for a period of time.

Manchester control staff were in the emergency control centre at the time of the air-raid (which saved their lives). After the building had been restored, following the flooding it had sustained, the staff had to remain in occupation for a protracted period owing to the difficulties of obtaining the vast amount of apparatus and equipment required to re-establish such a large office. In May 1942, a new scheme for a permanent office for 36 staff was finally started which was completed and in full operation on Monday 13 September 1943. This was located on the ground floor in room 7 of the Hunt's Bank with new fittings and apparatus throughout. A total of 32 desks were laid out in two suites of 8 set back-to-back. A dais across one end of the office desks was for the head controller and two deputies, with a further desk making 36 in all. The desks of the inside rows of the suites accommodated the 16 section controllers and on the outside rows sat the specialised controllers (passengers, rolling stock and engines etc).

Fixed in front of each controller was a lamp-signalling keyboard, giving communication to the telephone circuits required and a switchboard was provided on the dais for circuit switching. Direct telephone communication was provided for 900 stations, signal boxes and locomotive sheds etc, plus with all local district control offices as well as adjoining divisional and district control offices.

Mounted above the keyboards on the Section Controllers' desks (the two inside rows) and covering cable racks, were geographical train boards giving a bird's-eye view of the areas for which the section controllers were responsible.

At the time, and in respect of the number of working positions plus the intensity and volume of traffic it controlled, this office was unparalleled in the UK.

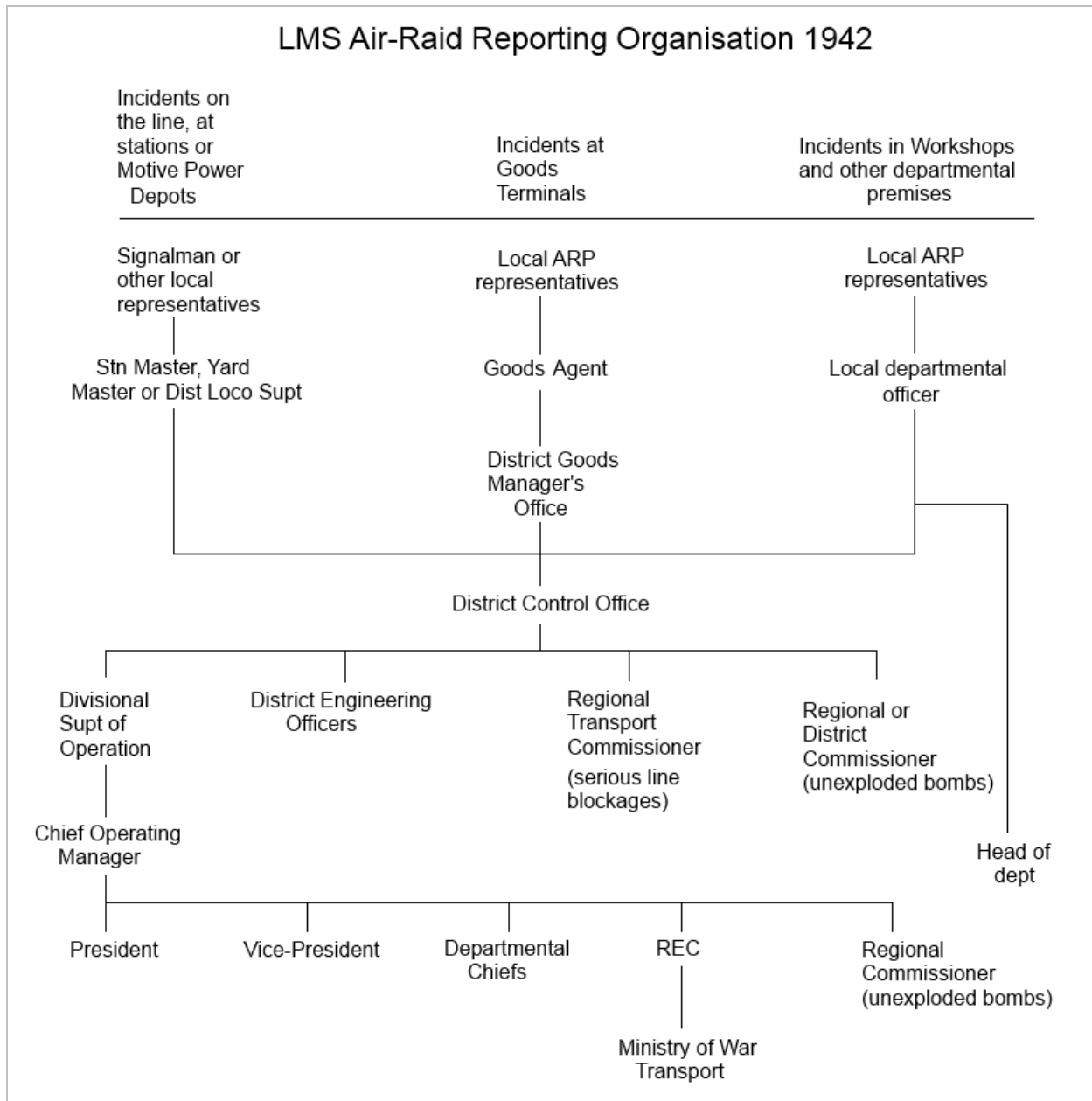


Fig 3: LMS ARP Reporting Organisation

4.5.5 Unexploded Bombs (on LMS Property)

The presence of an unexploded bomb or parachute mine was reported by the station master, yard master or goods agent, to the district control office, the local ARP controller and the permanent-way inspector or ganger, together with details of its position and traffic affected. The control office then informed the Regional or District Commissioner, the District Engineer and the Divisional Control office.

The Divisional Control office then gave the necessary information to the Chief Operating Manager at Watford, which in turn notified the Railway Executive Committee and took action with the Regional Commissioner concerned, giving his particulars of the traffic interference and placing the bombs and mines in one of the following categories of importance:

- 'A' – bombs or mines, the immediate disposal of which was regarded as essential for the war effort
- 'B' – bombs or mines, the disposal of which was important, but of less urgency
- 'C' – cases not necessary calling for immediate action
- 'D' – bombs which could be left for an indefinite period.

Responsibility for removing the bombs rested with army bomb disposal officers attached to the Regional Commissioners, while responsibility for dealing with unexploded aerial parachute mines rested with the Admiralty.

With regards to exploded bombs and the damage caused, small gangs of engineering department men were stationed at or near to the control offices during the night, so that after preliminary reports of incidents had been received, these men could be sent out to respective locations to ascertain the facts, so that the relative seriousness could be determined and the necessary arrangements made in the following morning for repair.

Stand-by trains loaded with emergency engineering materials were located at strategic points ready for transfer at short notice to areas where damage had occurred. Mobile sleeping and messing accommodation trains, consisting of a third-class sleeping car, a kitchen car and a vestibule car, were also stabled for use at remote localities. Similar stand-by trains were stabled within easy reach of cities subject to attack as well as mobile food canteens that could supply food for the emergency repair gangs.

4.5.6 Telephone Exchanges

Telephone and telegraph communications played a vital role in railway operation at all times and were of the upmost importance during the war. The possibility of telephone and telegraph equipment being destroyed or seriously damaged was foreseen at an early stage and in this respect received immediate attention when it was clear that war was a real possibility. At important centres exchange installations were duplicated in skeleton form in such a manner that essential business could be carried on during air-raids and in the event of main installations being put out of action.

Existing key telephone exchanges were given lateral protection, blast walls of either brick or concrete construction was provided and the entrances covered by traverses. Where a telephone exchange existed at a peace time control centre then it was duplicated in the control shelter. Key telegraph officers were protected in a similar way. At Euston (LMS), telegraph lines were extended to the basement of the Drummond Street building, which had been specially strengthened to accommodate the London Office of the Divisional Superintendent of Operation, Crewe.

During air-raids the normal installations were closed down and switched over to the alternative facilities

4.5.7 Wireless for Railway Operation

After the collapse of France in 1940, consideration was given to the situation which might arise on the railways in the event of an invasion or an intensity of an attack prior to an invasion. It was seen therefore that there could be a complete breakdown of telephone and telegraph communication. It was recognised that in such an event, the railway could, by arrangement with the Post Office, fall back on the emergency trunk telephone lines, but it was also highly probable that these might also be put out of action.

After approval had been granted by the military authorities as well as the various Government departments, the use of the wireless was proposed as a means of communication on the railways in an emergency, and the MoT authorised the purchase of the necessary equipment. The number of wireless sets required to provide coverage for the four railways was 100, of which 33 were allocated to the LMS, 30 to LNER, 20 to GWR and 17 to SR.

The organisation of wireless communication on the LMS was based on a backbone of fixed stations, with mobile stations mounted on motor vehicles, and in some cases e.g. remote locations in Scotland, on special trains and sited at convenient geographical locations ready for despatch to places within their area.

In the case of the fixed stations, the wireless sets were as far as possible installed in the emergency control centres, or if the reception was poor, then they were located elsewhere. The sets had a range of 50 miles, but under good conditions, this could be extended.

The locations of the fixed sets were at:

Ayr	Birmingham (Penns)	Bletchley
Carlisle (Scotby)	Crewe	Derby
Dumfries	Glasgow (Thornton Hall)	Gloucester
Holyhead	Lancaster (Caton)	Leicester (Wigston Magna)
Manchester (Stockport)	Perth (Forgandenny)	Preston (Longton Bridge)
Watford.		

Mobile stations (30 cwt Bantam Karrier road vans):

Carnforth	Chester	Derby
Glasgow	Gloucester	Llandoverly
London (Willesden Jun)	Normanton	Stirling
Swansea	Warrington	Watford.

Mobile stations mounted in rail vehicles:

Aberdeen	Dalwhinnie	Forfar
Inverness.		

4.5.8 Signal Boxes

A number of experiments were conducted before the war, and it was finally agreed that the best method of protection would be a steel shelter made from ¼ inch thick plate which could be placed on the working floor of the box to enable the signalman to take cover at times when he was not concerned in the movement of traffic. At first only selected boxes were protected in this way, but after the intensive bombing campaign of 1940/41, it was decided that all boxes should be protected.

Certain main signal boxes such as Crewe (North and South Junction) were reconstructed with more substantial walls and a concrete slab roof 4 in thick for protection against blast and incendiary bombs. Large areas of glass windows proved difficult to protect, the best method being a covering of cellophane which proved its worth on 23 December 1940, at the Victoria West Junction signal box when the window blew in onto the station master and signalman, the cellophane saving the men's faces from serious injury.

New signal boxes erected in vulnerable areas were constructed on the lines approved for ARP requirements. Brick 14 in thick blast walls were another form of protection, particularly for timber signal boxes, or 0.5 inch steel plates fixed to the timber cladding but most of these were recovered immediately post-war.

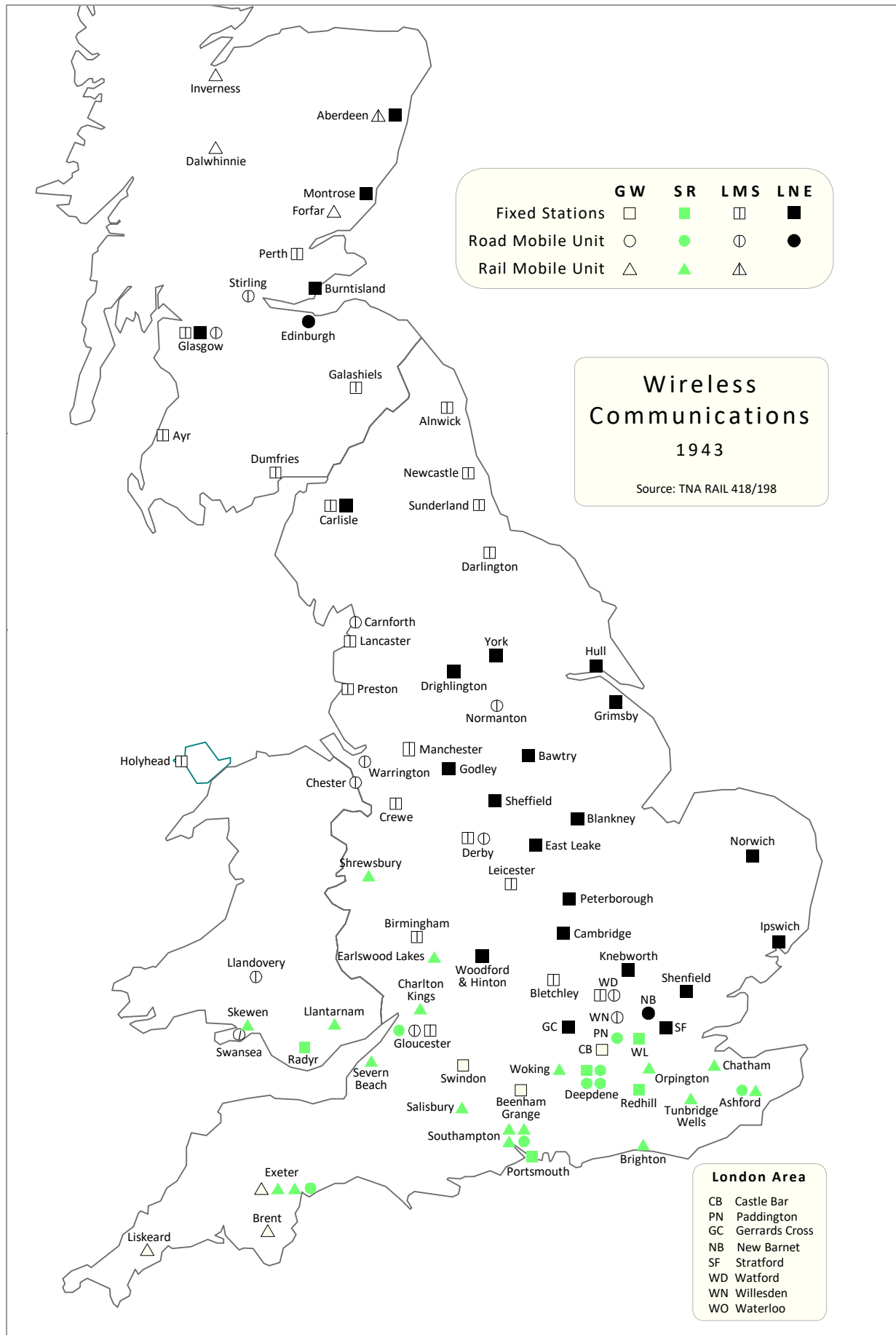


Fig 4: Wireless Communications 1943

4.5.9 Dispersal and Non-Dispersal of Control Rooms (LMS, GWR, LNER and SR)

Each division and district was provided with either an alternative purpose-built protected office accommodation (control room) or by adapting existing premises or by using existing ramparts or tunnels, in which staff could carry on their work whatever conditions existed outside. There appear to be two types of non-dispersed LMS-designed generic district emergency control rooms (although very few buildings are extant to confirm this). These were almost certainly adopted by the LMS and GWR – although this has been difficult to prove. There is a bomb-proof version (sic), and the other for less vulnerable areas, capable of withstanding near-miss blast, incendiaries and splinters. In addition to these, there is one bomb-proof divisional design. These are known as:

- Type A1 Divisional Control Room
- Type A2 District Control Room
- Type B2 District Control Room.

In September 1940, the LMS had only £5,865 left out of £267,600 remaining to be spent on works for their emergency control rooms and this was used up in the following month, thus completing their obligations to the money sanctioned by the MoT on 3 January 1939.

4.5.10 Extract from TNA file: RAIL 418/197 to 201

The Operating Department of the LMS Railway during the Second World War

Having regard to the importance of the control organisation from an operating standpoint, the Divisional and District Controls were provided with alternative protected office accommodation in which the staff could carry on their work whatever the conditions may be outside.

Two types of Emergency Control Offices were designed, one calculated to withstand bombs up to 500-lb in weight – Type ‘A’ built in two sizes A1 and A2, for Divisional Controls and some District Controls respectively, and the other a blast and splinter-proof shelter – Type B2.

Type ‘A’ was a fortress-like construction with reinforced concrete walls of 3 ft and 1 ft 6 in with 3 ft thickness of sand between and overhead cover of 10 feet made up of two layers of reinforced concrete 4 ft and 2 ft with a 4 ft layer of sand between.

Type ‘B2’ had reinforced concrete walls and a roof 1 ft 3 in thick. In the majority of cases the shelters were of entirely new construction, but in a few instances existing buildings were adapted for the purpose by strengthening the structure to the standards required.

Each type was provided with telephonic equipment connected to all circuits, a generator with diesel engine to act as a stand-by set in case of failure of the main electricity supply, and the whole building was ventilated by special plant to which gas filters were attached in case of gas attack.

The shelters were sited within easy access of the main control offices so that staff could quickly change over on receipt of an Air-Raid ‘Red’ warning.

The Divisional Emergency Offices had accommodation for a staff of 18, except in the case of Manchester, which seated 28. The District Control Centres seated 8.

In some instances additional provision was made for the local telephone exchange and telegraph office to be duplicated in skeleton form in the shelters and some shelters also accommodated the District Civil Engineer and Signal and Telegraph Technical Assistant where these officers were located within easy access.

The original intention was to cover all 55 control offices on the four divisions and a HQ Emergency Shelter at Euston, but when construction was started in early 1939 and firm estimates had been prepared, it was found that the Government grant would not cover the provision of the shelters at all sites. It was therefore decided that a cut would have to be made and only those in what were then considered to be the vulnerable areas were proceeded with. This reduced the number to 41.

With the fall of France and the intensive raids during the autumn and winter of 1940/41, the theories of the vulnerability of any particular part of the country completely changed, and the remaining 13 offices (Aberdeen and Perth having already been covered by other means) were provided with type B2 protection in 1941.

In addition to the emergency controls, a shelter was provided in the Tube at Euston Station 70 ft below ground to house the Chief Operating Manager's (COM) staff required on duty during air-raids, plus an alternative main telephone exchange. After the evacuation of the HQ staff to Watford on 4 September 1939, the shelter was continuously occupied by the section appointed to maintain liaison with the fighting services which remained at Euston until the following June, owing to the absence of office space at The Grove. Thereafter the shelter was used by the Euston telephone operators at nights and during air-raids.

To afford protection to the COM HQ staff at Watford who remained on duty during air-raids, a blast and splinter-proof surface shelter was constructed alongside hut A2 at The Grove.

The foresight in providing the emergency control shelters was proved by the extent to which they were used to carry on the work during air-raids, no matter how heavy, and in particular when the centralised control office at Manchester was destroyed in an air attack on the night of 22 / 23 December 1940. In addition to saving time the lives of the controllers on duty at the time, the shelter equipped as it was with telephonic apparatus which would have been most difficult to procure at the time, provided an alternative office from which control operations on the Central Division had to be conducted for a long period whilst another permanent office had to be established.

Below is a list of the emergency shelters provided in each division:

LMS Emergency Shelters				
Division	HQ	Shelters		
Western	Crewe DC A1	Birmingham A2	Basford Hall A2	Wigan A2
		Willesden A2	Barrow B2 (a)	Bletchley B2
		Chester Type B2 (d)	Heaton Norris B2	Lancaster B2 (a)
		Liverpool B2	Nuneaton B2	Patricroft B2
		Preston B2	Rugby B2	Stafford B2
		Stoke-on-Trent B2	Warrington B2	Workington B2 (a)
Central	Manchester DC A1	Huddersfield B2	Wakefield B2	
Midland	Derby DC A1	Chaddesden A2	Fenchurch Street A2	Kentish Town A2
		Leeds A2	Masborough A2	Saltley A2
		Toton A2	Bath B2 (a)	Burton B2
		Cudworth B2	Gloucester B2 (a)	Gowhole B2 (a + b)
		Kirkby (a + b)	Leicester	Melton Mowbray (a + b)
		Nottingham	Peterborough (a + b)	Rowsley (a + b)
		Skipton (a)	Staveley	Wellingborough
		Westhouses (a + b)		
Northern	Glasgow DC A1	Carlisle A2 (d)	Motherwell A2	Polmadie A2
		St Rollox A2	Aberdeen B2 (c)	Edinburgh B2
		Inverness B2 (a)	Kilmarnock B2	Perth (c)
<p>(a) Authorised in 1941. Previously protected by sandbags.</p> <p>(b) Standard design altered to permit conversion into permanent offices after the war.</p> <p>(c) Not provided with Type ‘A’ or B2 shelters but with shelter accommodation to Government Code standards.</p> <p>(d) Incorrect, Carlisle had B2 and Chester A2. Note that the reference to B2 may indicate an existing building that has been proofed to B2 standard of protection</p> <p>Source: RAIL 418/197 to 201</p>				

4.5.11 LMS Headquarters

a) Second World War

As war drew near, the decision was taken and approval given on 27 April 1939, to evacuate the whole of the LMS headquarters staff, both managerial and departmental from Euston House to The Grove, Watford, a course similar to that adopted by other railway companies.

In 1939, The Grove consisted of around 60 rooms and stood in an estate of 300 acres, owned at the time by the Equity and Law Life Assurance Company. The sale was completed on 15 May 1939 at a cost of £89,538 and was purchased by the LMS property company, Lineside Estates. Following purchase, the sum of £70,000 was allocated to prepare the property for occupation, which included the erection of 39 timber huts and air-raid shelters. These were erected by Holliday & Greenway Ltd. Before the war, The Grove had been equipped with the nucleus of a telephone system, both internally and connected to the existing railway network. Teleprinters were also installed for use by the operating department.

The growth of rail movements of service personnel and stores involved the expansion of the organisation at Watford. It became responsible for maintaining liaison with the three fighting services for implementing their requirements and co-ordinating train arrangements with the other train companies. A blast-proof control office was constructed for this purpose and was opened on 15 February 1943; this was operated in the strictest privacy in order to safeguard secrecy. It was equipped with plugboards for the concentration of the telephones which, inter alia, gave direct access to the War Office telephone network connecting LMS HQ with the Navy, Army and Air Force. In addition to saving time and the lives of the controllers on duty at the time, the shelter provided an alternative office from which operations on the Central Division could be conducted for a long period whilst another permanent office had to be established. It was equipped with telephonic apparatus which would have been most difficult to procure at the time.

Apart from the timber huts there were a number of air-raid shelters of standard LMS design and construction of prefabricated precast concrete units arranged in a series of rectangular grids. One such structure is extant, consisting of letter-identified shelters ('A' to 'M') laid out in a row running east-west with concrete arched entrances and tunnels.

b) The Immediate Post War Period

A scheme was put together in 1949 /50, for the possible evacuation in times of a London emergency, of the London Midland Region HQ staff, along with essential staff of the British Transport Commission (BTC) and the Railway Executive (RE), (55 Broadway, 222 Marylebone Road and Euston Station offices). At that time there were 652 non-essential staff employed at The Grove which would have to be displaced and negotiations were also in hand of placing some of the accommodation there over to the Road Haulage Executive for normal peacetime use (with an added stipulation that, in the event of a national emergency arising all such accommodation would be evacuated).

It was therefore proposed that the following would be available for essential staff:

- The Grove House
- 'C' & 'F' blocks (7 huts) – RE
- 'A', 'B', 'D' & 'E' blocks (21 huts) – LM Region
- 'H' block (4 huts) overflow for either BTC or RE.

The Grove telephone exchange had been mothballed since the war and could easily be brought back on line; this had 580 extensions with 40 PO lines and 40 railway trunk lines – two Creed teleprinter circuits were available, but no teleprinters.

From 1948, The Grove was actually used as a staff training college for the Road Haulage Executive, part of the BTC, becoming a work study training centre in 1957. In 1962 the BTC was abolished and replaced by the British Railways Board and the site became the productivity services training centre, before a name change to the management services centre.



Plate 8: One of several entrances to the air-raid complex at The Grove, Watford



Plate 9: One of the rectangular-shaped section of the air-raid complex at The Grove

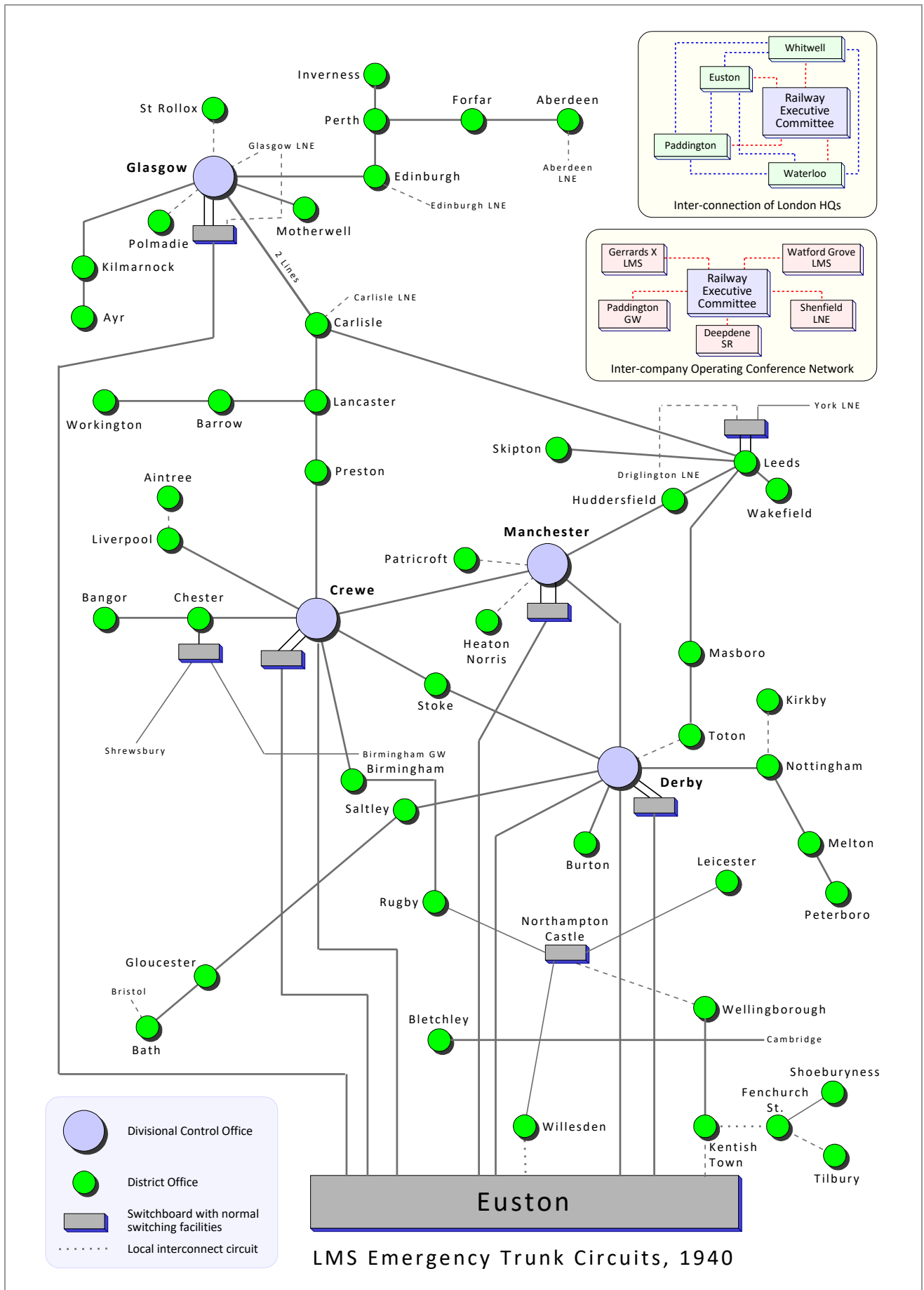


Fig 5: LMS Emergency Trunk Circuits, 1940



Plate 10: The Carlisle District Control Room

Note that the entrance projects out from the main building and that the roof is thinner than the Chester example, suggesting that it is an LMS type B2 Control Room. Since the end of the war, the level of the carpark has been significantly raised and its now impossible to gain access. Photo: Russel W Barnes



Plate 11: Type A1 Divisional Control Room, Crewe – looking at the main entrance end



Plate 12: Type A1 Divisional Control Room, Crewe – view looking at the emergency exit end.

The earth bank continues around the side and rear elevation to at least half wall height.

This particular building is similar to Chester in that it is uncluttered on the outside but has both exit and entrance along the main elevation. Behind this wall are the three auxiliary plant rooms and the two main exhaust vents can just be seen above the red cone. The fuel inlet still has part of its hose attached.



Plate 13: Type A1 Divisional Control Room, Crewe – services

The fuel inlet hose is top right, then a domed bad air vent, followed by an exhaust duct and a smaller duct (non-return valve top left). This is similar to Chester, but the domed vent cap is missing

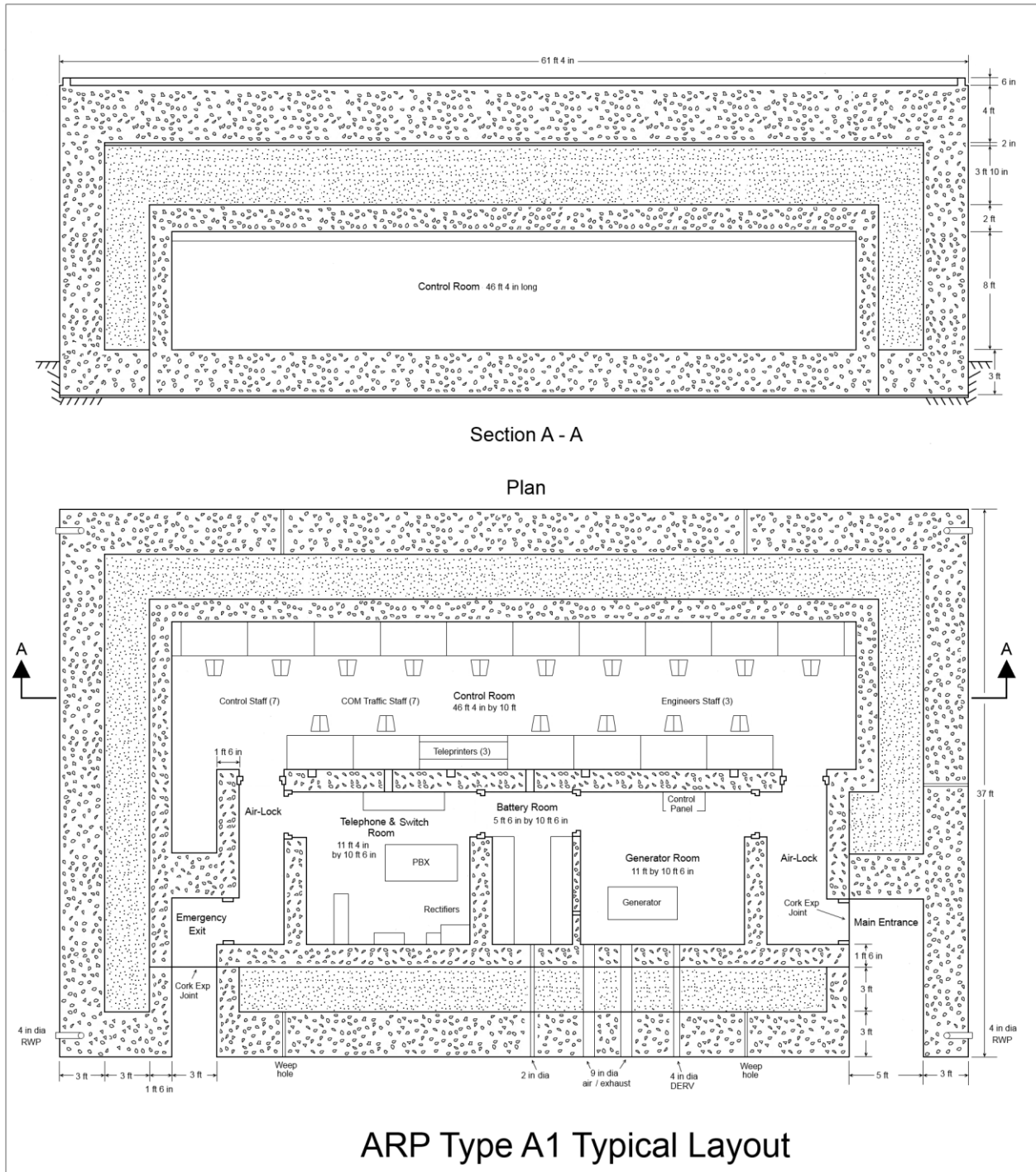


Fig 6: Re-drawn plan and section of LMS ARP type A1 Divisional Control Room
Based on a Network Rail Archive drawing 6970 dated 4 April 1939.

The building has two main working areas, consisting of a large control room with 16 desks and 3 teleprinters, making up one half and the other is sub-divided into a three ancillary rooms consisting of a generator room, battery room plus a telephone and switch room. The emergency exit airlock also forms part of this area, while the main entrance is part of the exterior wall.

- External wall: 7 ft 6 ins (3 ft exterior wall, a 3 ft void filled with sand and an inner wall 1 ft 6 in thick)
- Roof: 10 ft thick (4 ft 2 in burster slab, 3 ft 10 in void filled with sand and 2 ft lower slab)
- Building measures 61 ft 4 in by 37 ft
- Internal walls are mainly 1 ft 6 in thick except for one, which is a 6 in wall.

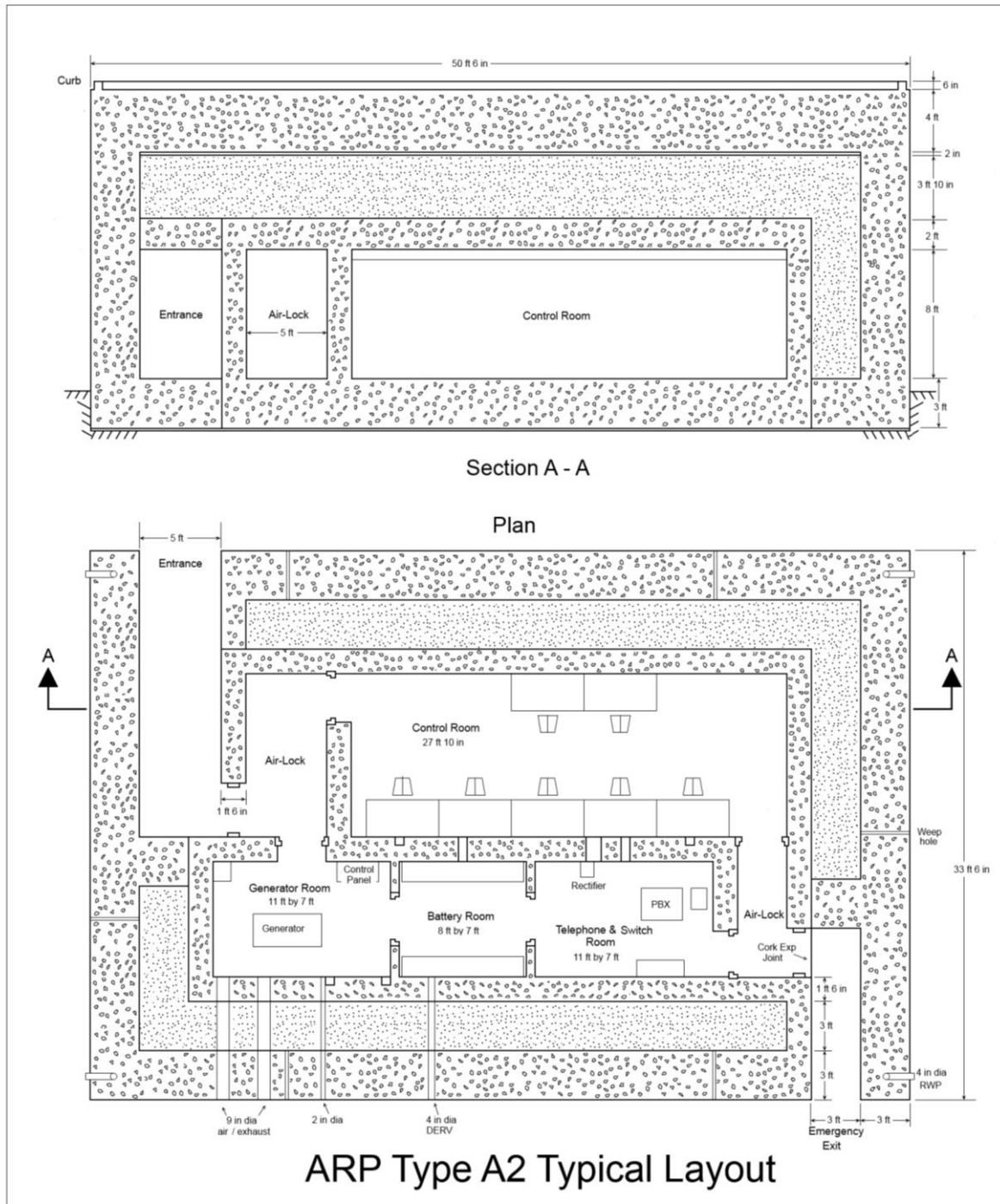


Fig 7: Plan and section of LMS ARP type A2 District Control Room (generic design)
Based on a Network Rail Archive drawing 6972 dated 3 April 1939.

The building has two main working areas, consisting of a control room with 7 desks (no teleprinters) and the main entrance air-lock making up one half. The other is sub-divided into a three ancillary rooms consisting of a generator room, battery room plus a telephone and switch room. The emergency exit airlock also forms part of this area, while both the main entrance and exit baffles are part of the external wall.

- External walls: 7 ft 6 in (3 ft exterior wall, 3 ft void filled with sand and an inner wall of 1 ft 6 in)
- Roof: 10 ft (4 ft burster slab, 3 ft void filled with sand and a 2 ft lower slab).
Building measures 50 ft 6 in by 33 ft 6 in
- Internal walls are mainly 1 ft 6 in thick, except for two which are 6 in walls.

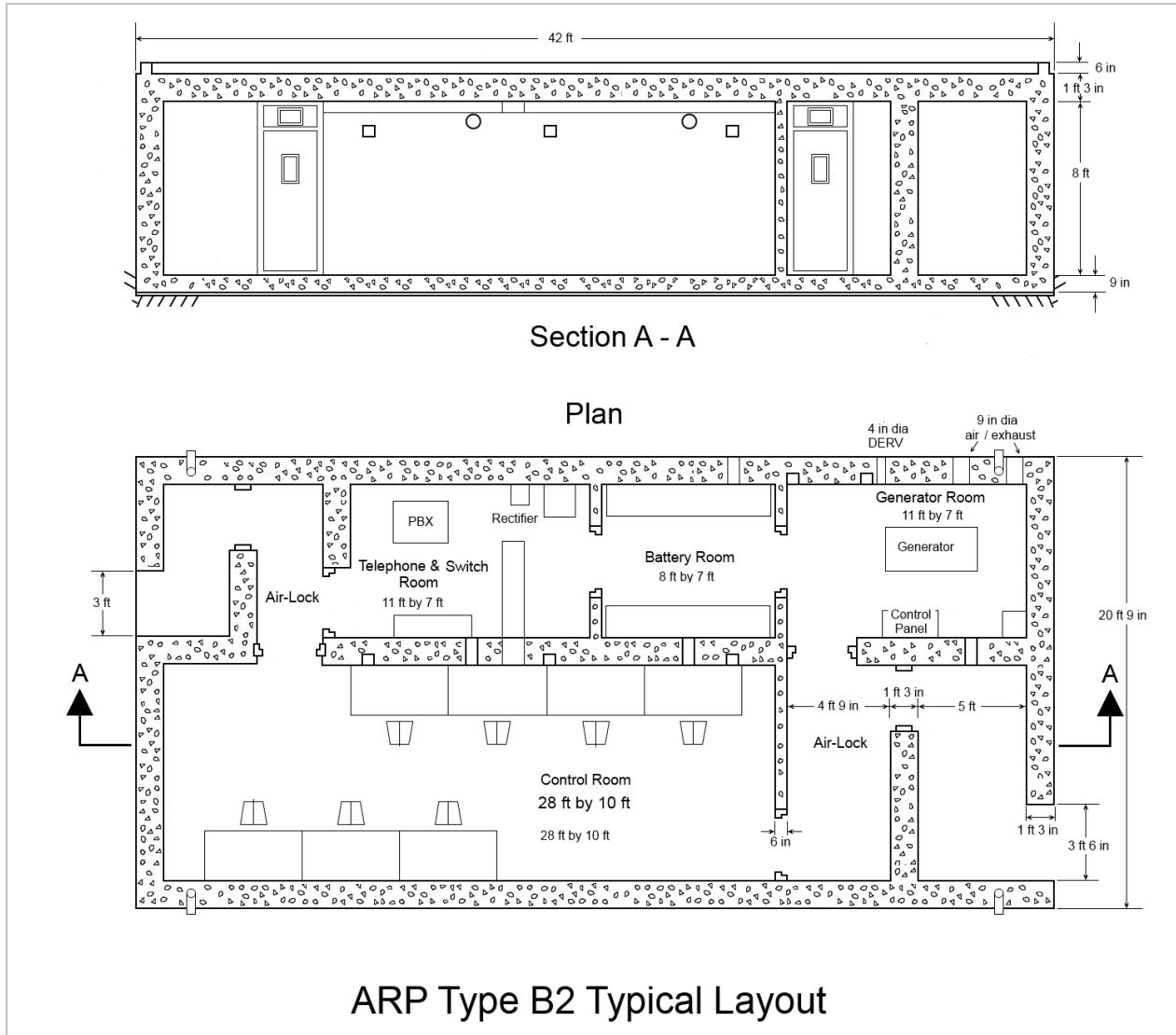


Fig 8: Plan and section of ARP type B2 Control Room
Based on a Network Rail Archive drawing 6973 dated 4 April 1939.
Note that the internal dimensions of the type B2 is similar to the generic type A2.

The building has two main working areas, consisting of a control room with 7 desks, the main entrance baffle and air-lock forming one half. The other is sub-divided into a generator room, battery room plus a telephone and switch room. The emergency air-lock and exit baffle is also located in this half.

- External walls: 1 ft 3 in
- Roof: 1 ft 3 in
- Building measures 42 ft by 20 ft 9 in. Note that the interior working space is similar in area to the generic A2 district design
- Internal walls are 1 ft 3 in and 6 in thick.

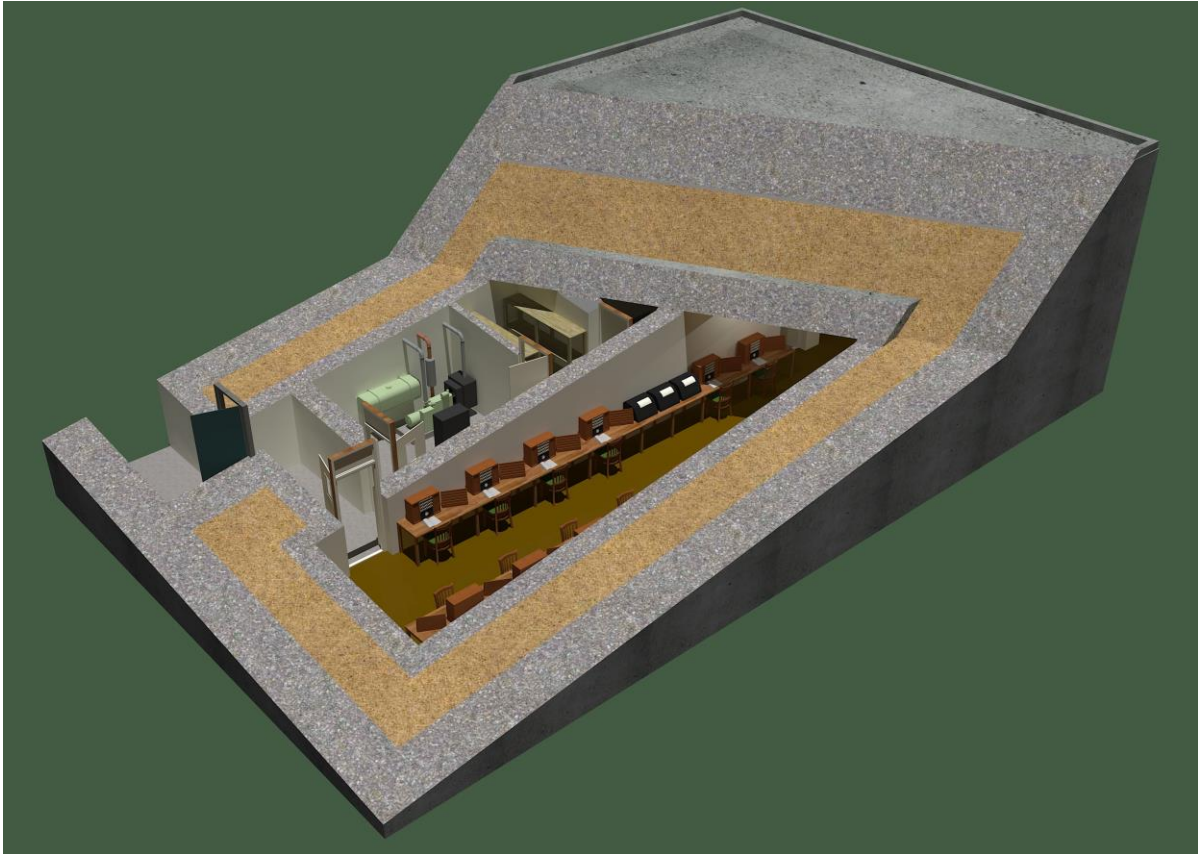


Fig 9: Exploded view of a typical Type A1 Emergency control room

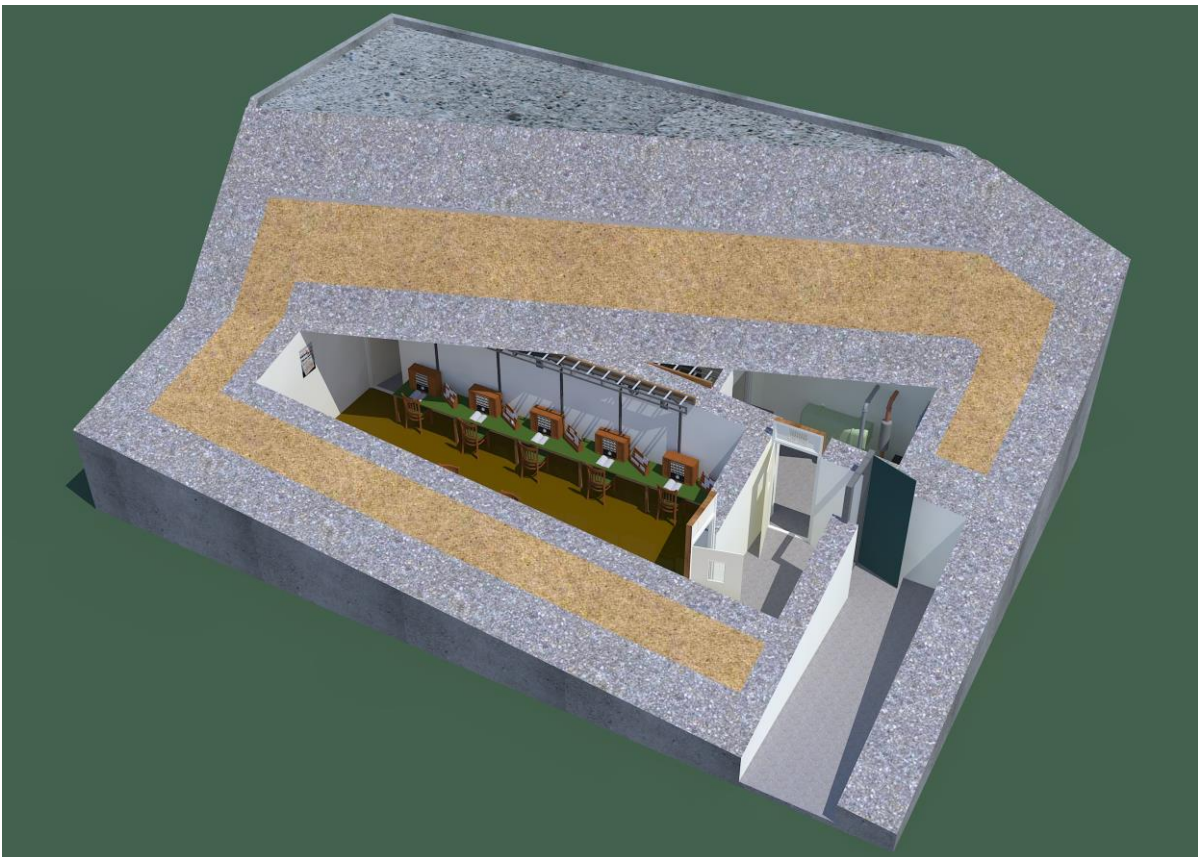


Fig 10: Exploded view of Type A2 Control Room

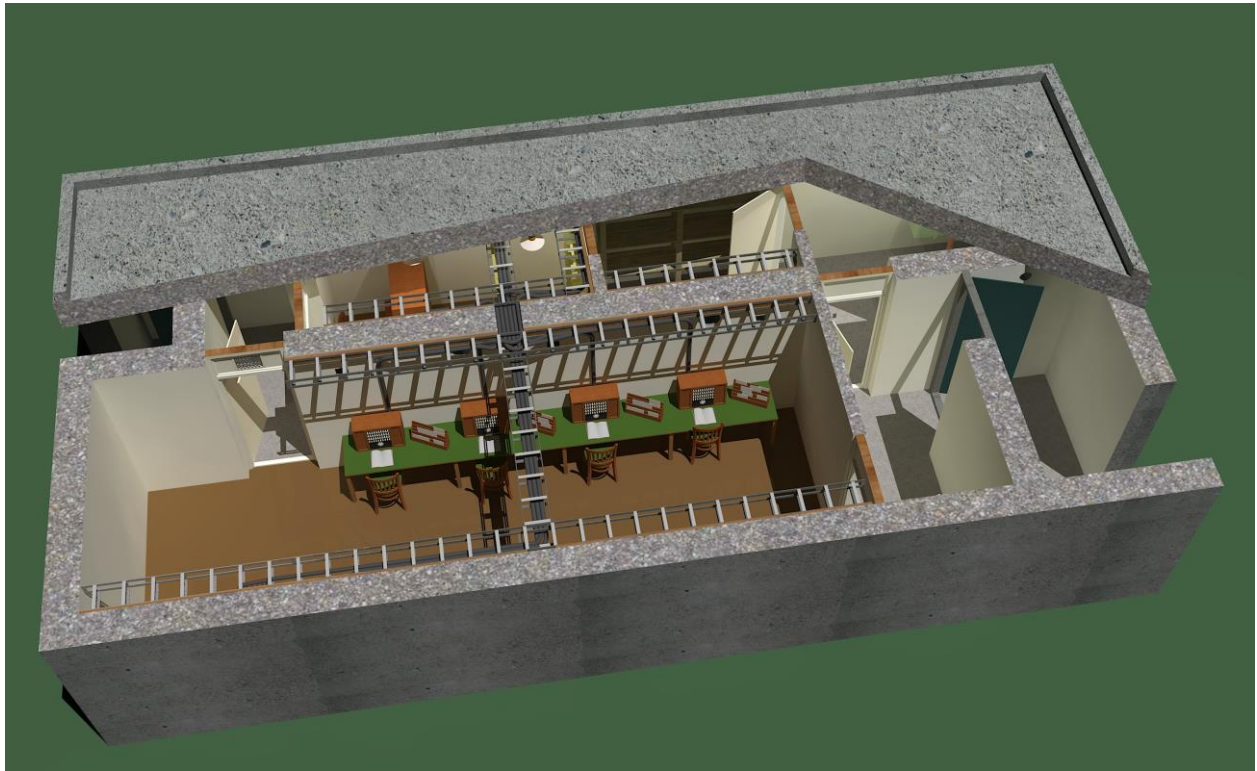


Fig 11: Exploded view of Type B2 Control Centre



Fig 12: The control room of a Type B2 control centre
Computer generated models. Paul Bellamy

4.6 Divisional and District Control Rooms, (LNER, GWR and SR)

4.6.1 LNER

In the case of many of the LNER Divisional Control Rooms that were dispersed into the provinces away from the vulnerable areas, Western Control moved to Gerrards Cross, Eastern Control (Liverpool Street) to Shenfield and King's Cross District to Knebworth.

The first ten key operating staff for the dispersed LNER emergency control rooms within London Area were sent for the first time on 29 August 1939 to Gerrards Cross and Knebworth. The numbers of operating personnel for each of the London Area rooms were:

Beaconsfield (10) Denham (10) Gerrards Cross (60) Shenfield (80) Knebworth (30).

The main problem in 1940–41 concerning the evacuated rooms seemed to be of finding suitable billets for the staff, as much of the available accommodation had been earmarked for evacuees – it is thought that this problem was overcome by installing hutting for sleeping quarters.

The Knebworth building was completed in July 1939 but was never large enough to accommodate the whole of King's Cross District Superintendent's control and clerical staff; it was therefore extended during 1942 with an additional floor, constructed in 9 in brick at a cost of £3,460. It was originally divided into three rooms, the largest of which accommodated 26 staff for an area of 792 square feet. Apart from it being badly overcrowded, a number of staff had to be housed separately in unsatisfactory quarters nearby. Approval was given on 31 January 1942 to increase the accommodation at Knebworth by the addition of a second floor at a cost of £3,460, this was not blast and splinter proof, the ground floor being used to accommodate all staff during an air-raid.

Knebworth Admin and Control Centre Staff for 30 December 1941:

Admin and control centre (42)	Station Master's Office (2)	General Waiting Room (3)
Telegraph office (1)	Lock-up shop nearby (5)	Goods office (7)
Saloon coach stabled in the goods yard (6).		

a) 'Whitegates', Shenfield

The new office building at Shenfield was constructed at 'Whitegates' – an area of 'dead' ground between the down Colchester main line and the Southend loop line; off Alexander Lane, it housed staff from room 97 on the top floor of the general offices at Liverpool Street. It was originally single storey but in 1940 a pair of pillboxes was apparently added to the roof. In more recent times, these have been removed along with four chimney stacks and another storey added. Extensions have also been built onto both end walls. The building contained three large rooms, one of these for the typing pool; a central desk was provided that was wired and equipped with switchboards which duplicated the circuitry at Stratford control located on the top floor of the locomotive erecting shops at Stratford Station. If the need arose, it could be transferred promptly to Whitegates – but it was never used. The company WC French built Gerrards Cross and Shenfield / Whitegates and Knebworth was constructed by J Willmott.

Construction is of 13.5 inch solid brick external walls with metal casement windows, the top-light opening inwards (hopper light) and the complete sash is hinged on one side, also opening inwards. All windows have hinged steel shutters. Internally there is a longitudinal central spine of 13.5 in brick with 9 in and 4.5 in brick room-dividing walls. Five rooms had fireplaces. The reinforced concrete slab roof is supported on a concrete ring beam and cased steel down-stand beams.

There was also a short-wave radio room opposite the main building – both of these structures are extant.

b) Other LNER Office & Control Rooms

Away from London, at other vulnerable points, Manchester moved to Godley, Nottingham to East Leake, Leeds to Drighlington, Lincoln to Metherringham, and Doncaster to Bawtry. A few went underground; at York the NE Central Control combined with York District Control and was established beneath the city wall.

Norwich District Control found a convenient rampart close to Thorpe Station, and the Scottish Central Control, together with the Edinburgh District Control used the derelict Scotland Street railway tunnel (Type B2 Shelter standard).



Plate 14: The dispersed LNER Lincoln District New Office Building at Metheringham
This has since been demolished – NGR: TF 07722 61389. Photo: Mick Parr



Plate 15: Wireless room, 'Whitegates', Shenfield



Plate 16: The dispersed 'Whitegates', Shenfield LNER New Office Building
Now with additional floor but clearly showing the original single-storey building.
It is unknown when the first floor was added or the end extensions but is presumably post Second World War



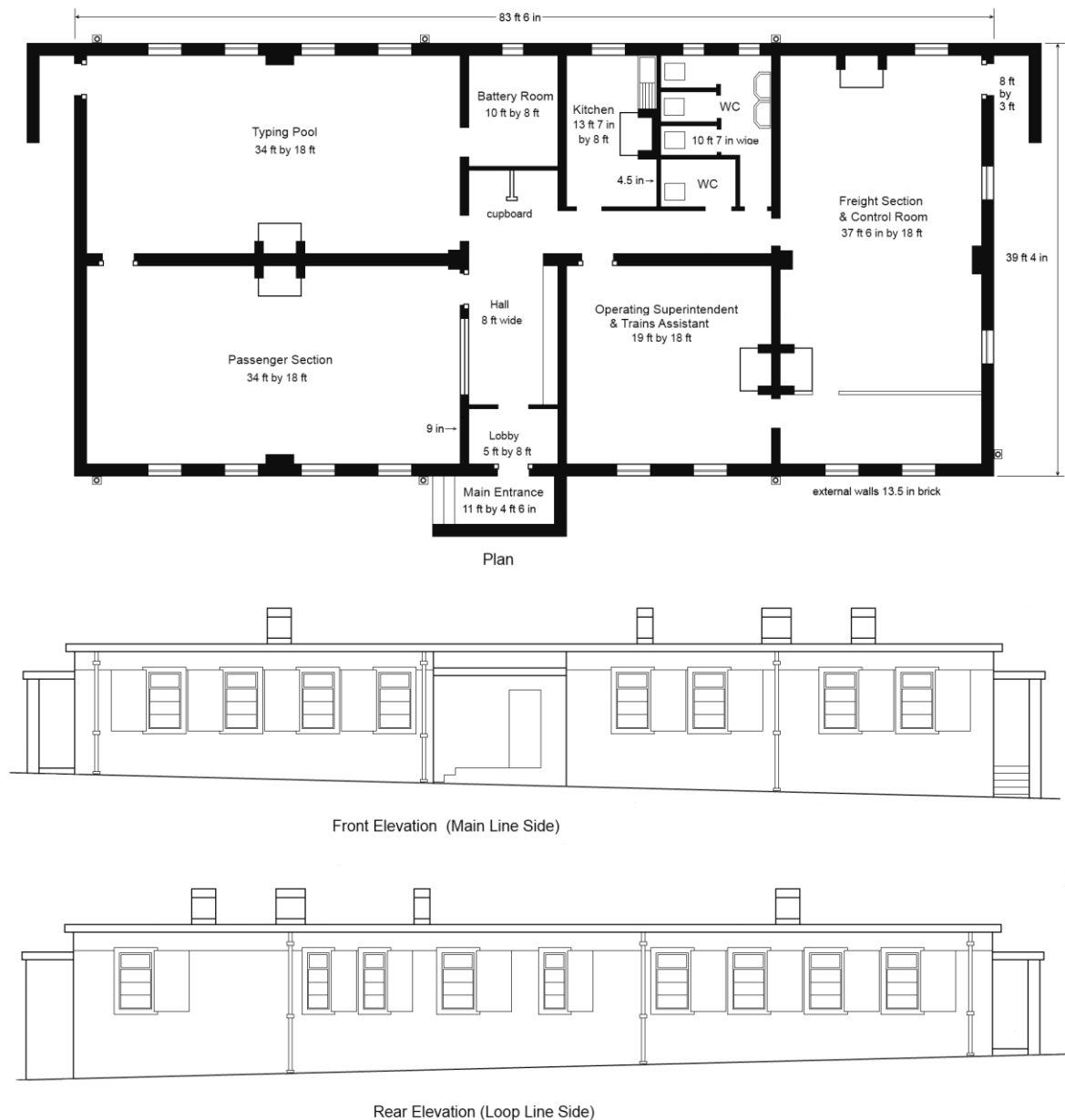
Plate 17: 'Whitegates', Shenfield LNER New Office Building, close-up
Showing the substantial metal frames and anti-blast shutters – note too, the English bond brickwork



Plate 18: The dispersed 'Whitegates', Shenfield LNER New Office Building shutters open



Plate 19: The dispersed 'Whitegates', Shenfield LNER New Office Building



Shenfield / Whitegates LNER (Southern Area) New Office Building

Fig 13: 'Whitegates', Shenfield New Office Building.

Based on a Railtrack drawing dated 1939 & 1944, an article by Ted Summerfield / Great Eastern Journal, and on site observations. The ground (access road) has since been levelled out

4.6.2 GWR

As far as the GWR was concerned, it is thought that by 31 July 1940, the construction of the emergency control rooms had been more or less been finished, except for £5,713 out of the £110,000 agreed by the MoT, but the internal fitting had yet to be completed. This may have been because there was a delay in the delivery of the telephone switchboards which were supplied by The General Electric Co Ltd. As far as I can tell, the GWR control rooms were of similar design to those built for LMS.

4.6.3 Southern Railway

a) Deepdene Hotel

Repairs had to be carried out to the main building and an annexe to provide emergency lighting, emergency water supply tank, cooking equipment, plus installation of a goods hoist at a combined cost of £9,925. The annexe was also repaired, converted into dormitories and garages at a cost of £4,550. The cave system which initially was converted into an air-raid shelter received new floors, emergency exits, and seating lavatories at a cost of £1,425.

A new telephone exchange was built in the cave system at an estimated cost of £5,620, which was submitted for approval on 1 March 1941. The scheme also included a battery room, three other rooms as well as male and female toilets.

b) Battle Headquarters

Approval for the Southern Railway administrative and control centres – later known as battle headquarters (BHQ) – was proved on 19 April 1939 at a combined cost of £10,653. It is unknown when the underground BHQs were built but they were certainly operational by the outbreak of war.

The original drawings for the non-dispersed divisional SR underground battle headquarters (presumed to be titled type H1 and H2 types) are also yet to be discovered.

Woking was a Type H1 reinforced concrete control centre, 45 ft long which cost £3,000 – the estimate for this building is dated 12 July 1939. The site also included wooden huts for use as offices and for sleeping which cost a further £6,270. Air-raid trenches were also provided at a cost of £1,151. The total cost was £11,381 which included all fittings and telephones etc.

It is known that at Woking, 15 telephone lines were withdrawn from the station and installed in the BHQ during September 1939. Additional lines were requested for Orpington and Redhill BHQs in May 1940. The original ventilation was in the form of extractor fans installed after January 1940, but authorisation for the gas-proofing of the BHQs was placed with the Ministry of War Transport on 13 December 1941 and four days later it was approved – the estimates were as follows:

- London East Divisional HQ – Orpington (£1,350)
- London Central Divisional HQ – Redhill (£1,490)
- Southern Divisional HQ – Southampton (£1,636)
- Western Divisional HQ – Exeter (£550)
- London West Divisional HQ – Woking (£ unknown).

The Southern Region, up to 31 March 1941, had overspent on all of its obligations regarding ARP. That for emergency control rooms required another £10,901, of which £6,855 had been spent by that date.

From July 1941 mobile road canteens, in the form of converted Morris vans plus three Bedford lorries, were brought into use following an air-raid. These were based at Croydon, Wimbledon and Eastleigh and were operated by the Engineer's Department for the benefit of all departments as required.

Since the war-time Divisional HQ had been established at Orpington the total number of staff had been increased from 113 (including 12 female clerks) to 135 (including 22 females), which was the result of the additional amount of work that was dealt with in war-time. In July 1941 it became necessary to employ more women typists; additionally a number of huts previously used for sleeping were converted into offices.

The SR Southern Divisional Engineer's normal HQ was located in Brighton Station and it is believed that after July 1941, the emergency headquarters was located at No.4 The Grove, Horley.

The SR Southern Divisional HQ was located at Central Station, Southampton, but this was damaged by enemy action, which necessitated the temporary removal of the staff to Salisbury until they could return in May 1941. It was proposed that in view of the probability of further damage, that emergency accommodation should be provided in a train of coaches which would be stabled at Romsey Station.

Part 5: Case Study: Chester Type A2 District Control Room

5.1 Background

Located at Chester Railway Station used to be a larger than average type A2 control room, it was inspected on 16 December 2013 and 13 January 2014. The building was derelict; there is no electricity and had to be artificially lit with torches and flash photography. It was demolished during April 2014, but was inspected again on 4 and 5 April during the early stages of its demolition.

5.2 Chester District

Chester District included Llandudno and Rhyl, which were part of the Western Division of the LMS Railway and operated jointly with the Great Western Railway, it was categorised as a Type 'B' non-vulnerable area. At first, an existing building was adapted at a cost of £1,800 plus a further cost of £672 for additional electrical equipment. Construction of the new bunker was jointly funded by both companies at an estimated cost of £6,100 (LMS £2,440 and GWR £3,660); a request was made to the MoT on 24 August 1939 for its sanction, which probably made it one of the last to be built.¹¹ The estimate allowed for the construction of the shelter complete with lighting, ventilation, WCs, shelving, plus a specially designed and fixed desk with seating. The building was provided for emergency use only, at a cost of £4,539. Also included was a single-position telephone exchange with cabling and batteries at a cost of £1,561.

During 1940, Chester passenger station and yard employed 773 people; in a typical peak period 545 staff would be on duty. Air-raid shelters had been erected to accommodate 300 staff and it was proposed to erect others to accommodate another 245. Chester goods offices employed 150 staff, of which during a typical peak period, 126 would be on duty; air-raid shelters were provided for 100 personnel and it was proposed to provide shelter for a further 26.

5.3 Design

The design of the generic 'protected' Type A2 room with regards to its construction has almost certainly been carried out with reference to certain post-First World War Swiss and French Government studies and the British ARP Handbooks Nos. 5 and 5a which followed later.

It is possible that the Chester building is another type as it is far larger than the generic A2 design – this was almost certainly because it was operated jointly by LMS and GWR, but the original drawing has not been discovered, so for the benefit of this report, it is identified as a district type A2.

There were almost certainly variations and economies carried out to these designs such as the differences between types A2 and B2, both of which are monolithic concrete buildings. Carlisle (B2) was built before Chester (A2) and cost roughly £1,000 more, and yet the exterior walls are single skin and without the sand infilling. From the outside, chief differences between these two is that Carlisle has an external entrance rather than one built within the walls (as the walls are single skin), while the emergency exit appears to be internal, whereas Chester has both entrance and exit arranged internally contained within the exterior wall. Furthermore, Carlisle is (now) semi-buried while Chester is totally above ground.

The Chester building is aligned nominally north/south; it used to be located within an open area adjacent to a train shed, but is now within an NCP car park. It occupies a slightly sloping site, the land falling north to south. Close to the east elevation is a post-Second World War brick-built electric substation and a concrete raft followed by the tarmac car park. To the north is the entrance to the car park, followed by a train shed and to the south is an access route to a fenced storage compound and to the west is narrow fenced storage compound, followed by the car park of the Queen Hotel.

¹¹ This compares with the following GWR emergency control room projects: £5,400 on 31-3-1939 at Swansea, £6,250 on 11-5-1939 at Worcester, £6,450 on 24-5-1939 at Plymouth, £4,280 on 16-6-1939 at Gloucester and £5,350 on 14-7-1939 at Exeter – these were all of the same type design and fittings. Note that Chester and Swansea were each added as an afterthought, the original rooms being in existing buildings (see Appendix III)

The building is totally above ground and consists essentially of a windowless 64 ft long by 36 ft wide monolithic reinforced concrete box, with external walls that are 7 ft thick. The footprint is clear and uncluttered, without projecting air-locks or lobbies. At first glance it may appear to have a solid roof and walls, but this is not the case.

The building has a floor slab which is a foundation raft and this 'floats' allowing movement in the event of a near-miss bomb blast. It has an outer wall which supports an outer roof – this being a burster layer, or protector slab plus an inner wall as well as the shelter roof itself. The voids between each inner/outer walls and inner/outer roof are filled with compacted sand which acts as a shock absorbing layer. It is designed to distribute the shock wave evenly over the roof if hit by an exploding HE bomb. The outer wall/roof and the inner wall/roof components, where they appear to be joined by concrete walls, are actually separated from each other by a 1 inch thick cork expansion joint. There is evidence of this inside the entrance baffle where it is possible to see the cork joint both vertically up the wall and horizontally along the floor.

The walls are constructed using shuttering and poured/tampered concrete mix having granite ballast with steel reinforcement bars laid in a grid at 6 inch centres. This was at first evident on the north and east elevations where the concrete had spalled in several places, owing to a thin layer of concrete over the reinforcing bars – the other elevations have fared better. The inner surfaces of wall and roof consist of cement rendered reinforced with 'Brunswick' close-mesh sheeting designed to prevent spalling of the concrete inside the building as a result of a bomb explosion close to the exterior wall, and the shock wave damaging the interior surface. This type of reinforcement only became apparent during demolition.

The roof part is nominally 7 ft thick (similar to the exterior walls), not including a concrete curb around the perimeter of the roof of around 6 inches square in section. Between the sand and the roof burster layer is a 4 inch blinding layer of mass concrete and from this the reinforcement rebars have been set out. The steelwork is laid out in a square grid pattern only, there being no angled bars.

There is a main entrance and an emergency exit located in the end walls, the northern one having an anti-climb wrought iron gate that opens outwards inside a well which suggests that it is a post-war addition – as it opens the wrong way for a Second World War ARP building. This is because outward opening doors and gates might get blocked by falling masonry thus trapping the occupants inside. The gate well is probably there because the tarmac road is now higher than the original surface – which is believed to have been a cobbled surface. The southern outer entrance is blocked off with plywood; from the exit is a brick-lined passageway and four steps up, as the surrounding land is 3 ft higher at this corner than the northern entrance. Along the west side in a compound, is a full length French drain with a concrete perimeter dwarf wall. It is assumed that the fuel tank serving the diesel generator inside the building was buried inside the western compound although no evidence for this was found.

The protected entrance and exit point is formed by baffle walls that are internal and therefore set into the main exterior walls – the advantage of this scheme being that it can occupy a smaller site and offers better protection to the occupants. The baffle walls are designed to protect the shelter from blast overpressure and also stops any flying splinters from any angle, the exposed exterior wall thickness being 2 ft 6 in – which is wider than the hidden walls. Both of these gives access to a blast-proof steel door at either end, which connects with the air-lock and what is now a corridor.

The entrance and exit floors are trowel flat – there are no foot baths present and the blast-proof steel plate doors do not appear to have gas-tight seals although these may be missing. During a gas attack and without them, gas vapour might penetrate the inside of the shelter which would then become unbearable without a respirator in about the time that it would take to smell the garlic-like odour.

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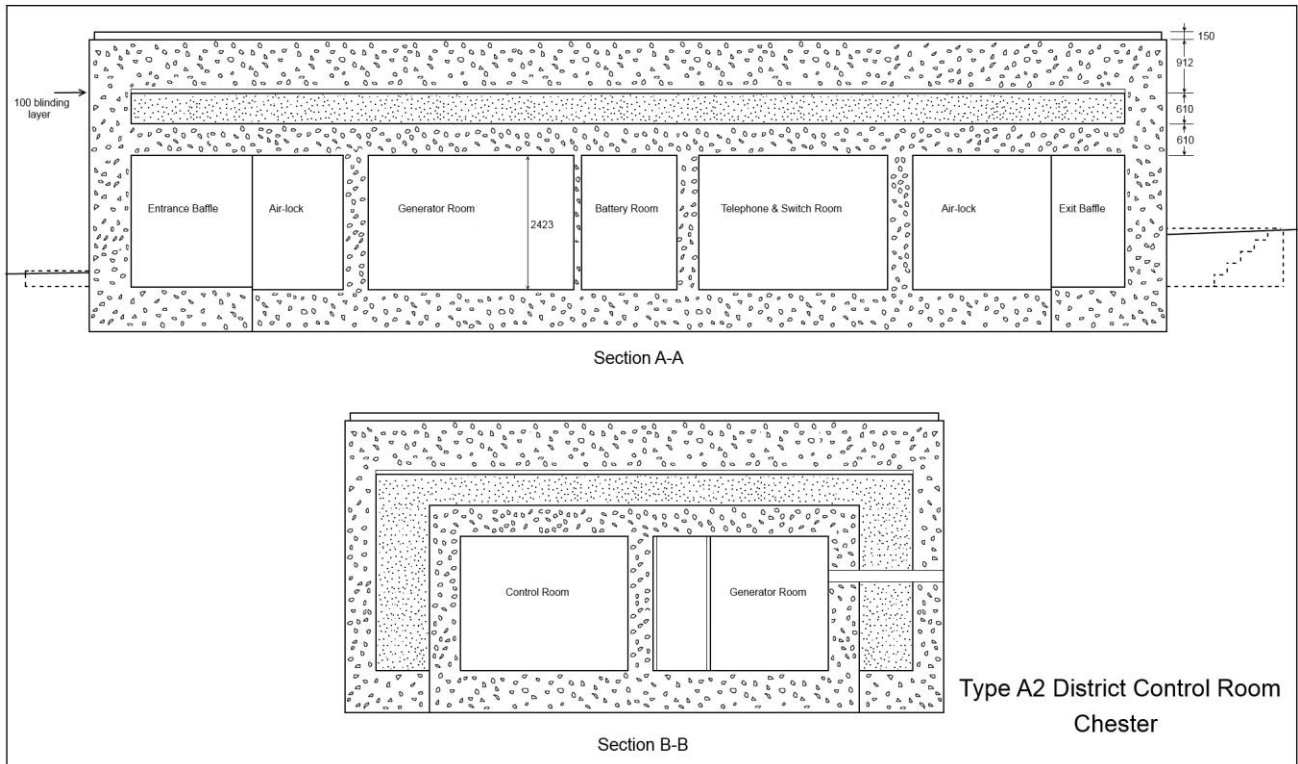


Plate 20: Sections of the Chester District type A2 building

The building has two main working areas, consisting of a control room with an unknown number of desks, (a generic A2 had 7 but this one may have had 14 as it was a shared LMS and GWR control room). It is unknown whether there were any teleprinters installed. The other half consists of the usual three rooms (generator, battery and telephone and switch rooms), plus both air-locks. The entrance and exit baffles are located within the exterior wall at the end elevations.

- External walls: 7 ft (2 ft exterior wall, 3 ft void filled with sand and an inner wall of 2 ft thick)
- Roof: 7 ft (3 ft burster slab, 2 ft void filled with sand and a 2 ft thick lower slab)
- Building measures 64 ft by 36 ft
- Internal walls are 6 in, 1 ft 3 in and 1 ft 6 in thick.

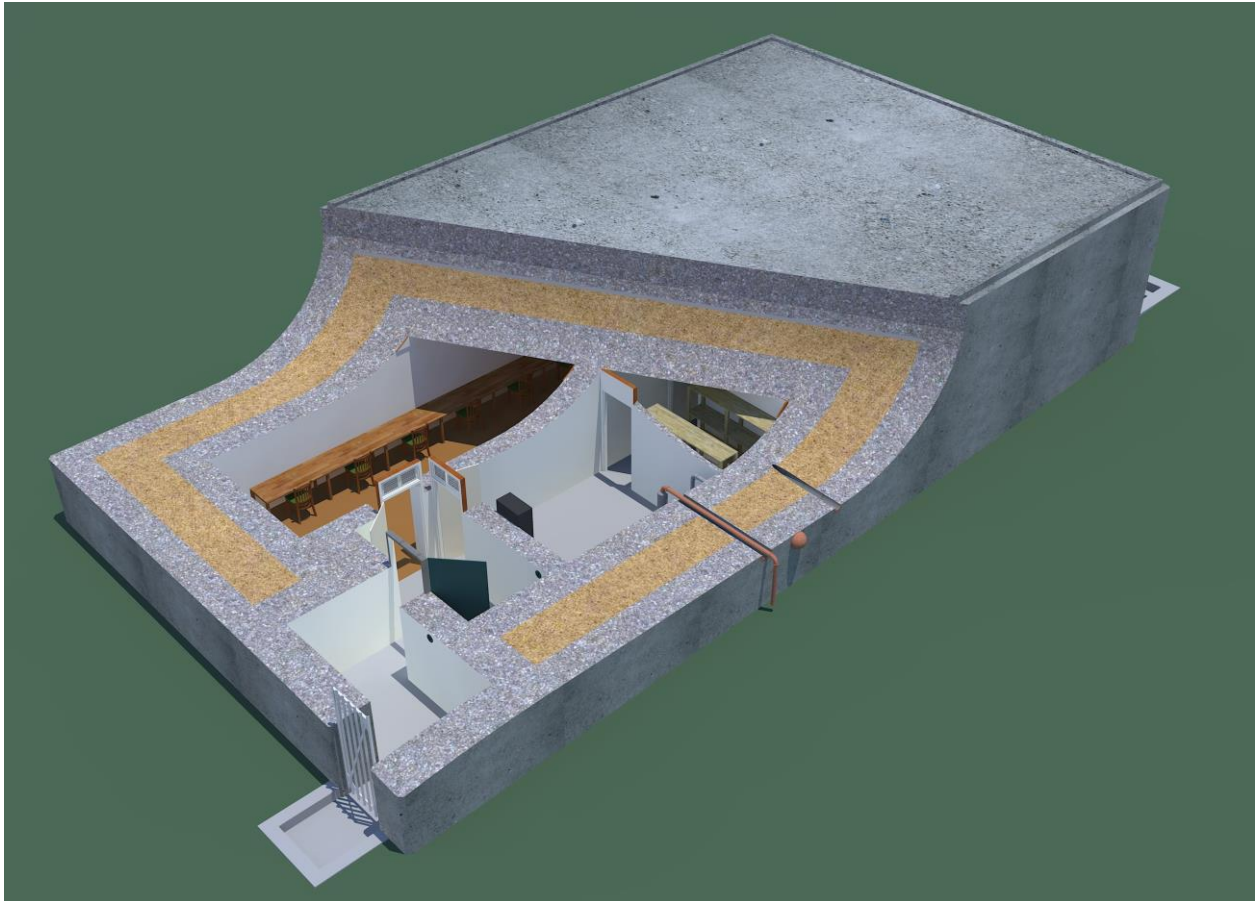


Fig 15: Exploded view of Chester District Type A2 Control Room
Computer-generated model. Paul Bellamy



Plate 21: Type A2 District Control Room at Chester – front elevation
Note the minor damage to the concrete surface on the left.



Plate 22: Distant view looking towards Chester Railway Station with the control room in the foreground
There is a concrete slab adjacent to the modern electric sub-station of unknown function



Plate 23: View looking north with exit in end wall
It just possible to make out the curb on the roof which is set back from the wall perimeter.
Marks made by the shuttering process of laying the concrete can clearly be seen.



Plate 24: Interior of main room looking north towards the entrance



Plate 25: Wide-angle view looking south with doorway from the main entrance air-lock on the right
Note the wooden coving for carrying cabling



Plate 26: Entrance air-lock



Plate 27: View from exit air-lock along 'new' corridor

5.3.2 Rooms

a) Air-lock

The steel blast doors at both ends open out into air-locks, but the other doors of both air-locks are missing; the doors to the control room appear to have been quite substantial compared with those to the auxiliary rooms. An air-lock therefore has three doors, not two as seen elsewhere, so that when entering, two doors should always remain closed. A typical steel door is thought to be a Hope's Type S.2, splinter-resisting door supplied by Henry Hope & Sons Ltd from their office at North Bank House, North John Street, Liverpool. It is made from 5/8th inch thick mild steel plate – it is not gas proof.

Each steel door opens inwards and is connected to a substantial steel frame set into the concrete walls, with sliding bolt and a pair of handles to lock the door from the inside. The northern door has a knocker which is not present on the southern one and is substantially wider than emergency exit; it is assumed therefore that the southern door is the main entrance and that the other one is an emergency exit. The missing doors from the northern air-lock to the control room and auxiliary rooms were timber, fitted to timber frames. The floor of the main room is 2 in below the buffer entrance and exits, and the internal ceiling height is 8 ft.

Beyond auxiliary room 3 (room numbering runs north–south) is the emergency exit and air-lock. The air-lock here is wider than the entrance one.

Inside the concrete shell, are two parallel compartments (50 ft by 10 ft and 50 ft by 10 ft 6 in) which is far larger than the generic LMS design for a type A2, with measurements of 27 ft by 10 ft and 27 ft by 7 ft. The reason for this is presumably because the Chester building was manned by control staff from both LMS and GWR. One of the working areas consisting of a number of small auxiliary rooms and these are separated from the main open-plan room by a concrete wall that is 1 ft 6 in thick with two access points, one at either end of three auxiliary rooms. These are subdivided by concrete walls with doorways between rooms so that the original access route was through each room in turn to get from one end to the other. The door frames are present but without the doors, the run is now a longitudinal corridor joining up with the entrance and exit at either end, but now having walled spaces between.

With the Chester building, and despite the presence of a pressure relief valve, the lack of a completely gas-tight facility (because of the lack of gas-tight doors), rules out any form of internal air regeneration (whereby no air taken in from outside) so that the air in the shelter is purified and re-used over and over again. It would therefore have been necessary to draw fresh air into the main working rooms and mechanical ventilating plant would have been required to do this. One method might have been with electric fans so that fresh air was drawn into the building – another would be from an engine-driven fan and gas filtration plant but this is unlikely as the plant is not shown on the surviving drawings.

The central spine wall has three high-level but partially filled-in 9 inch diameter vents which may have been where the fans were but there is no trunking present. It is assumed that dirty air from the main room was vented via the non-return rectangular vents above the door frames into the air-locks and presumably this and bad air from the auxiliary rooms was in turn exited the building via the high-level pipework.

b) Auxiliary Room 1: Generator

The first room adjacent to the main entrance air-lock is the generator room and although it is almost devoid of Second World War fittings, there is evidence of the plant. On the floor for example, there are scars from the sawn-off steel framework of the engine stand. There are two 9 in diameter scars on the exterior wall where pipe flanges entered the room; one of these is presumed to be for the exhaust duct for the engine, while another smaller one is thought to have been a fuel pipe. This room is also where the main incoming electric cables and switchgear is located.

In more recent times it may have had larger Cold War air ventilating plant, as there is an incomplete high-level mounted framework which could carry filter tins.

c) Auxiliary Room 2: Battery Charging

The next room is the battery charging room which is empty and almost devoid of fittings except for a similar 9 in diameter scar on the exterior wall, there is also a high-level pressure relief valve or non-return valve. Another wall fitting is an LMS stamped two-pin communication socket.

d) Auxiliary Room 3: Telephone and Switch

The final auxiliary room in the row is the telephone and switch room. This again is devoid of fittings apart from a complete three-gang light switch in-situ and two substantial floor-mounted cable entry / exit conduits.

Around the perimeter of the room at high level, is a timber coving which had cable brackets. There is also another LMS two-pin communication socket and several electrical plates fixed to the wall. In more recent times a timber partition has been built to separate from the 'new' corridor.

e) Main Room: Control

The main compartment is arranged as a single, open plan room and in more recent times had been full of racking, but this has now been removed and is completely devoid of fittings; it is the control room. Although no fittings are present, it is possible to see where the original light fixtures and their switches were located. Cable trunking entered the room from the adjacent auxiliary rooms, through a high-level rectangular-shaped opening. Around the perimeter of the room, at high level, is a timber coving which once had cable brackets, but these are now missing.



Plate 28: Type S.2 splinter-proof door



Plate 29: Auxiliary room 1 – generator room



Plate 30: Auxiliary room 1 – incoming electrical mains



Plate 31: Auxiliary room 2 – battery room



Plate 32: Auxiliary room 3 – phone and switch room
Note the timber coving with steel brackets



Plate 33: Exit air-lock with splinter-proof steel door and two door frames with exhaust vents above



Plate 34: View looking towards the exit air-lock from the control room



Plate 35: Auxiliary room 2 – pressure relief valve or non-return valve
This and the following seven plates depict a centimetre scale



Plate 36: Auxiliary room 3 – underground communication cables and conduit



Plate 37: LMS communications wall socket inside rooms 2 and 3



Plate 38: Wall mounted electrical switched socket plate of a type found in various rooms



Plate 39: Believed to be vent flanges inside the exit air-lock



Plate 40: Non-return exhaust valves above the air-lock doors to the control room



Plate 41: Exterior wall DERV fuel inlet pipe and flange



Plate 42: Exterior wall steel flange of what is believed to be a clean air vent

If this is the case then the vent would have risen vertically to take air from above a possible gas cloud.



Plate 43: Post-war ceiling mounted ventilation filter



Plate 44: Main entrance baffle

Note the vertical cork expansion joint and the chamfered corner

Part 6: Cold War

6.1 Due Functioning of Railways in Wartime

6.1.1 Introduction

Due functioning of the railways was an annual Government grant available from the beginning of the 1953/4 financial year with a proposal for £1.7m to be allocated in that year, and a similar or decreasing amount annually for five years, (some sources say three years). The money was partly allocated to certain construction enabling projects for decentralisation of key operating staff in order that the railway network could function in time of war.

It was originally going to be a five-year plan, but the general economic situation in 1956, meant that the money allocated in the 1956/7 year was reduced from £1m to £173,990 and while the planning for a possible war continued, construction of static projects were curtailed and never recovered.

Due Functioning fell into two main groups:

- Works that had no peacetime value and works that had both peace and war value.
- The stockpiling of plant, materials and equipment (this aspect is not discussed here).

Of the £1.7m for 1953/54, the Eastern Region was allocated £180,000, out of which, on 11 November 1953, the Works and Equipment Committee recommended an expenditure of £37,500 for providing services and footings for three emergency control centres (Sheffield, Bawtry, and Dore & Totley). This was approved by the British Transport Commission on 12 November 1953. The Works and Equipment Committee then recommended on 24 February 1954 for a further £45,000 for equipment and cabling for the three control centres, and this in turn was approved, plus a further £43,000 was also made available for these two projects and for the setting up of a mobile control unit.

Estimates for footings had been calculated on the basis of 5 ft protection, but by the time that the commission had approved the this figure, the Home Office had recommended that only 2 ft protection was required. Getting the drawings adjusted to that standard took a period of time plus the long delivery period for the cabling meant that the two projects (cabling and footings) could not be completed within the financial year. This led to an underspend resulting in lost money.

6.1.2 The Problem of resiting a large number of Emergency Control Centres

A meeting was held on 28 June 1949 at Euston with representatives from the Home Office, Ministry of Works, the Railway Executive and London Midland Region to consider the structural design of emergency control centres.

The idea on paper was, that when a threat to the UK appeared to be imminent, the operations of trains would be transferred to the shelter from the normal control centres so as to safeguard as far as possible, the operation of traffic, including possibly of the evacuation of the civil population up to the time of a possible explosion. It was hoped that at a distance of 10 miles from a potential target, the building would escape serious damage and be in a position, after an explosion even of megaton size, that the staff would be able to control the movement of trains as close up to the devastated area as possible. It was intended therefore, that staff would man the shelters before the start of hostilities and would remain in them for the duration of the threat or war.

In preparing the plans for the new centres, it was thought necessary to give more spacious accommodation than used previously in the wartime shelters, but the main problem was the fact that the Home Office had yet to publish their building codes for industrial shelters and it was envisaged that a degree of protection should be afforded against atomic attack.

For at least the next three years, a thickness of 5 ft for walls and roof was under then consideration (Type 'H' to drawing 315–52), which was based on the opinion of Sir Alexander Rouse (Home Office), and a Professor Webster (Railway Executive Committee) as being sufficient – given that the railway control

centres were going to be situated outside a target area, they should be afforded protection against HE only (note that 5 ft was also considered for inside target areas). Concrete of this order represented the appropriate standard of protection from a 500-lb HE medium-case bomb, and would also help to prevent the penetration of a 1,000-lb bomb. This thickness was also considered sufficient to keep out gamma rays. The estimated cost for a 23-man shelter with 5 ft thick walls and roof, in March 1952 was as follows:

- £23,000, for the building
- £2,100 for a concrete aprons surrounding the building,
- £6,000 for ventilation and £7,000 for fittings.

The weight of raw materials for its construction was:

- Cement: 550 tons
- Sand: 800 cubic yards
- Aggregate: 1,600 tons
- Reinforcement: 1,200 tons.

The weight of raw materials for the apron was:

- Cement: 75 tons
- Sand: 140 cubic yards
- Aggregate: 1,600 tons
- Reinforcement: 120 tons.

A type of light-weight reinforcement known as the Brunswick type was recommended within the inner face of the walls and ceiling (which presumably is the same as that used on the pre-war control centres). Like the older designs, the new shelters were to be designed as rigid boxes and provided with an apron to prevent bombs from finding their way below the building. The design would allow the shelters to move under the action of blast; such movement would be comparatively small and sufficient slack was allowed for this in the cables. During the last war the type of ventilating plant installed in the emergency control centres provided for 450 cu ft of air per person per hour, but this was felt to be insufficient and it was proposed to increase this to a new standard of 1,000 cu feet.

There were two preliminary designs, one for an extension to an existing type A1 / A2 shelter and the other representing a brand new building of which two schemes had been prepared – one with 5 ft thick walls and roof for control centres under consideration inside target areas and the other having 2 ft thick walls and roof for centres outside target areas. The foundation is a raft which forms the floor of the building and continues out from the building on four sides to become an apron. Entrance baffles provide four right-angled bends in the path of the blast before the interior of the building is reached.

It was proposed to build one shelter in each region as prototypes, so that the internal equipment could be installed and tested, although in practise this appears not to have happened. All others, if started at all, never went beyond the foundation slab, plus the exposed steel reinforcing for walls and piped services.

6.1.3 Reduction in Wall and Roof Thickness

Since the meeting described above, a draft Home Office standard industrial shelter code was published c.1952 recommending that the degree of protection for industrial shelters should only be of the order of 2 ft of concrete to comply with other civil defence control posts. From the railways' point of view, there was also a suggestion that the thicknesses could further be reduced to 1 ft in order to save money. It was finally agreed that 2 ft thickness would be adequate which also offered protection against a 50 megaton detonation at a distance of 10 miles and a presumed overpressure at that distance of 10 psi.

Along with other civilian industrial Civil Defence projects then under discussion and construction, the control centres were designed without any protection against biological or chemical weapons.

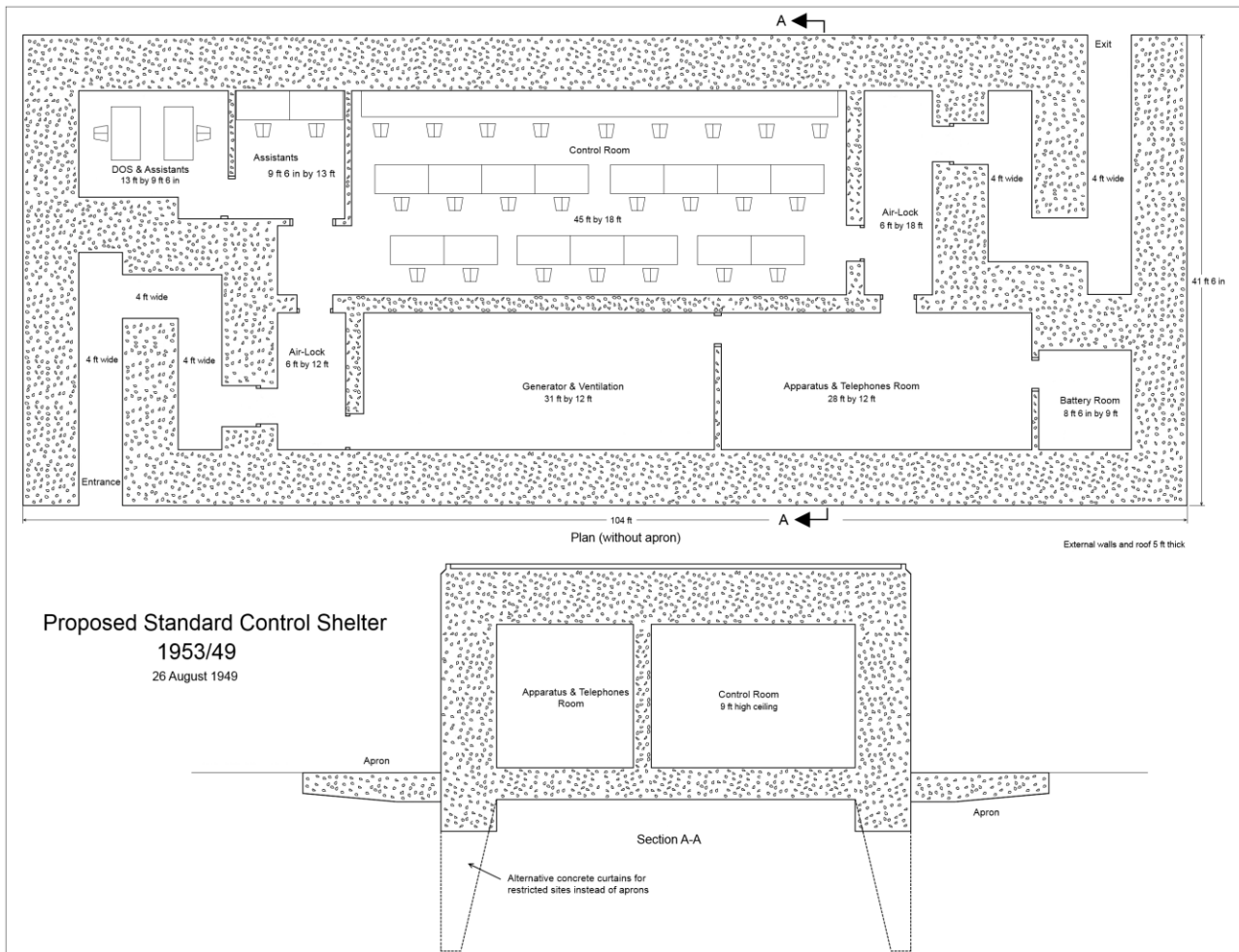


Fig 16: Proposed Standard Control Shelter of 1949

Note that the entrance and exit baffles take up a fairly large portion of the building. This drawing was superseded by 1151-53 which had similar 5 ft walls and roof, but featured a different type of entrance baffle, similar to the as-built 2 ft brick walls and roof version 1384-53. The building above would have been 104 ft long by 41 ft 6 in whereas drawing 1151-53 (Type 'H') would have been 101 ft 6 in by 41 ft 6 in and the as-built design (Type 'L') 1384-53 is 94 ft 6 in by 35 ft 6 in. Only the two 5 ft thick walled designs would have featured the aprons or curtains. Basically drawings 1151-53 and 1384-53 have similar floor layouts and of similar size, the main difference between the two being the wall and roof thickness.

The original design for Shenfield had the 5 ft walls and roof of the 1151-53 (Type 'H') design, but instead of being 101 ft 6 in long, it would have had a length of 140 ft, as it had two control rooms, – a standard length one (45 ft by 18 ft) for Stratford personnel, and the other to accommodate staff from Fenchurch Street (28 ft by 12 ft) with associated offices.

6.1.4 Enabling Projects

By October 1953 the Railway Executive submitted their proposals for the provision of services and footings (only) for the proposed dispersed emergency control centres in the London Midland Region – this was designed to provide alternative control centres outside of what was then considered to be target areas. The sites and estimates were as follows:

- London, Euston dispersed to Bricket Wood – £8,500 with annual cost of £150
- London, St Pancras dispersed to St Albans – £9,500 with an annual cost of £139
- Liverpool, Lime Street dispersed to Huyton Quarry – £8,250 with an annual cost of £150
- Liverpool, Central, dispersed to Hough Green – £8,500 with an annual cost of £150
- Manchester, London Road dispersed to Wilmslow £9,000 – with an annual cost of £141.

In addition provision of two mobile emergency control centres were purchased and re-fitted at a cost of £18,642. Each had three cars having generating, mess car and office accommodation and were and pressed into service for operation in the London Midland Region and former LMS lines in Scotland.

Other regions involved in decentralisation were as follows:

Eastern

- Liverpool Street / London, Stratford dispersed to Shenfield
- Doncaster dispersed to Bawtry
- Rotherham dispersed to Dore & Totley
- King's Cross to Knebworth
- Norwich to Wymondham
- Peterborough to Grantham

North-Eastern Region

- Newcastle dispersed to Stocksfield £7,500
- Hull dispersed to Market Weighton £7,500
- Sunderland dispersed to Fencehouses £4,500

Scottish Region

- Glasgow dispersed to Cumbernauld South (site may have changed to Burntisland)
- Edinburgh dispersed to Ratho

Southern Region

- Southampton dispersed to Romsey

Western Region

- Bristol dispersed to Westbury
- Cardiff dispersed to Creigiau
- Birmingham, Snow Hill to Widney Manor (the old emergency control centre at New Street Station to be converted into a telephone exchange)
- Newport to Triley (not traced)

There were many other proposals for emergency control centres to be built elsewhere, particularly in the London Midland Region, but these never went beyond installing cables and were believed to have been deferred owing to the financial situation that the country found itself in. Only those projects that were already well in hand were completed and could be considered for Government grant. Tentative proposals for the completion of certain emergency control centres for the 1956 /57 financial year were as follows:

Eastern Region

- Shenfield £40,000

London Midland Region

- St Albans £76,000
- Milnrow £60,000

North Eastern Region

- Market Weighton £57,000

Scottish Region

- Emergency control centre for 3 District Controls and 1 HQ Control for Glasgow, all located in one place £80,000

Western Region

- Westbury & Taplow £50,000

The position as at 9 September 1956 was that those listed below had been completed and the situation never improved beyond these five buildings. Where concrete floor slabs were built, in some cases it also included walls or just lines of vertical rebar with no concrete, such as at 'Whitegates', Shenfield, Grantham and in later years, the exposed steel work was cut down to floor level Completed buildings:

Bricket Wood Burntisland Huyton Quarry Knebworth Milnrow.

The concrete floor slabs at Grantham and Dore & Totley were built by Fletcher & Co (Contractors) Ltd of Mansfield, their tender for Grantham of £3,096 18s 6d was accepted on 7 October 1954. The sewage works for Bawtry and, Dore & Totley were begun in June 1955, the floor slabs having already been laid. The company WC French was awarded the contract on 19 April 1956 for the concrete floor slab at Knebworth at a cost of £4226 12s. 5d, but the construction of the superstructure was awarded to Wellerman Brothers on 18 October 1957 at a cost of £13,113 17s. 6d and work commenced on site on 12 November, the estimated completion date being 3 February 1957.

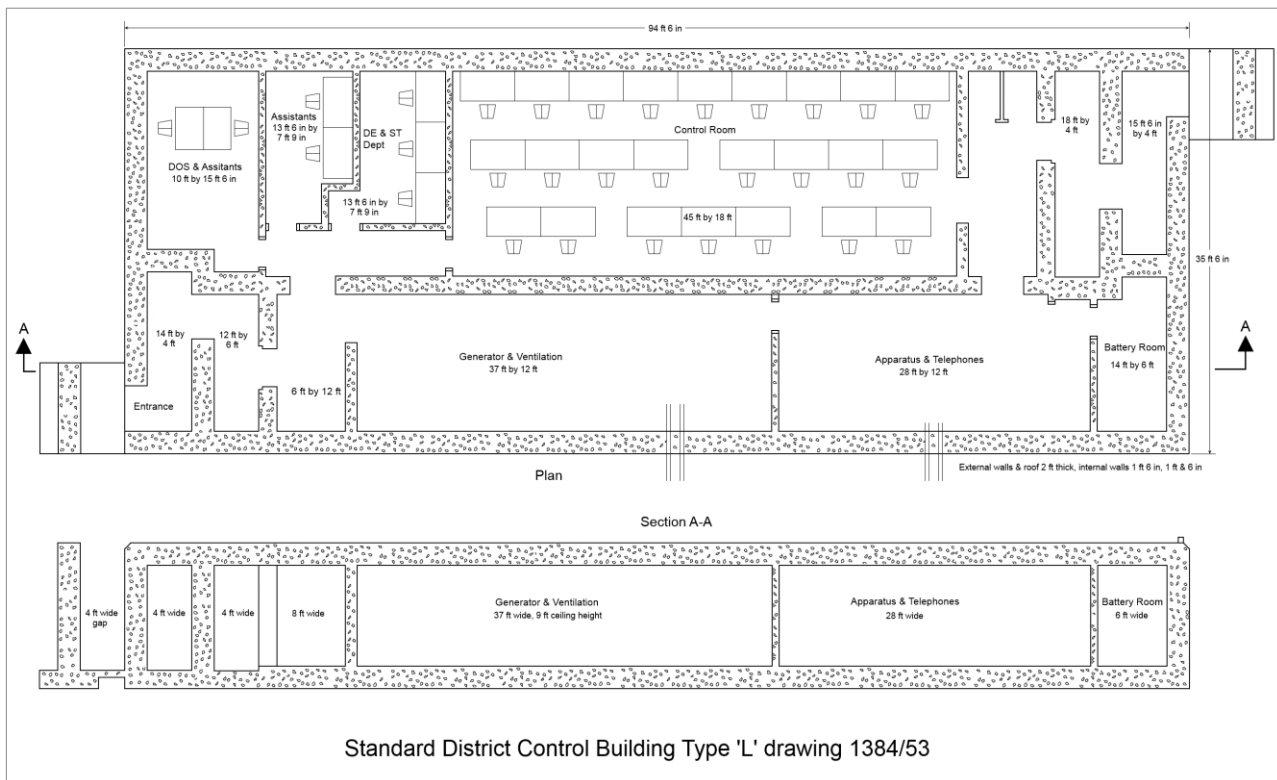
In order that the Knebworth control room could be tested under active conditions, it was furnished with eight control desks and keyboards plus four standard desks for wagon controller, passenger rolling stock, passenger trains and freight trains clerks. It is unlikely that the building was ever fitted with an electric generator set as there were concerns about the air intake allowing contaminated air into the building. Furthermore, there was never any provision for an underground diesel fuel tank or any fuel pipe set into the wall.

6.2 Decentralisation

By the end of 1949 the Railway Executive Civil Defence Committee had prepared provisional plans for the proposed decentralisation of Eastern Region headquarters, divisional and district offices which were located in the presumed target areas. In an emergency, the proposal was that HQ staff would be evacuated into the countryside. This was published as a Huttred Camp Report and the scheme involved relocating to Aylesbury, Bawtry as well as Hitchin (on an allotment site) or Welwyn Garden City.

This plan was superseded in 1951, by another more detailed approach to decentralisation, based on single- and two-storey Ministry of Works Temporary Office Buildings (TOBS) of 36 ft span, of similar design to those being erected for other Government departments. These had 11 in cavity brick construction with brick piers and hollow precast concrete floors and roof. The scheme for Eastern Region, which was divided into eight districts: King's Cross, Stratford, Sheffield, Doncaster, Peterborough, Cambridge, Ipswich and Norwich, is shown in the table overleaf – it is unknown whether any of these were actually built.

Decentralisation of Eastern Region Staff 27-03-52		
Department	Staff	To be Evacuated to
Headquarters Group	2,400	Frogmore Hall, Watton At Stone – existing house and hutted camp
Divisional Operating Superintendent (east)	183	Newmarket station buildings and new control centre
Divisional Operating Superintendent (west)	?	Gerrard's Cross ' <i>Craighead</i> ' private house and WWII control centre
Mechanical Electrical Engineers and Carriage & Wagon Engineer, Doncaster	298	Retford hutted camp
District Operational Superintendent, King's Cross	18	Knebworth single hut and new control centre
Stratford District Operational Superintendent, Fenchurch Street	?	Shenfield WWII office and new building
District Engineer, King's Cross & Signals & Telegraph Engineer, King's Cross	?	Stevenage ' <i>Orchard Court</i> ' or ' <i>Orchard House</i> ' private house
District Engineer, Stratford	75	Hertford East
Accountant, Marylebone (400 staff)	400	Aylesbury hutted camp
Accountant, and Accountant (Hotels)	354	Retford hutted camp
Accountant, Works, Stratford	250	Loughton hutted camp on sports ground
District Operating Superintendent, Doncaster	136	Bawtry WWII control shelter and hutted camp
District Engineer, Doncaster	50	Gainsborough or Bawtry hutted camp
Comms Superintendent and Stores Superintendent	?	Retford
Works Accountant, Doncaster	400	Bawtry hutted camp
DGS, DPS, DE, PRPO and Signals and Telegraph Engineer, Sheffield	307	Eckington / Renishaw hutted camp
District Operating Superintendent, Rotherham	?	Cudworth hutted camp plus new control shelter



Standard District Control Building Type 'L' drawing 1384/53

Fig 17: Floor plan of Standard District Control Building
Based on drawing 1384-53 plus observations at Bricket Wood



Plate 45: The Standard District Control Centre Type 'L' at Bricket Wood
Now used as a store for Travis Perkins Ltd



Plate 46: Bricket Wood – view looking towards the plant side elevation

6.2.2 'D' Notice!

As a result of enquiries from the Press, paragraphs had appeared in certain daily newspapers regarding one of the control centres under construction. As a result, representations were made with the Government and a 'D' Notice was issued on 11 October 1955 to the Press by the Services, Press and Broadcasting Committee. The Notice read as follows:

The construction has now commenced of buildings from which our railway communications will be controlled in the event of an emergency.

I am directed by the Services, Press and Broadcasting Committee to request you in the interests of National Security to publish no reference to these buildings which might indicate their purpose. I would add that this will not be apparent to the ordinary observer, either from their locality or appearance.

6.2.3 Type 'L' Emergency Control Centre Drawings

The following drawings are preserved at the National Railway Museum, York:

Type 'H' Emergency Control Centre:

1151-53 General arrangement drawing

Type 'L' Emergency Control Centre, dated September 1953:

1384-53 General arrangement

1385-53 Reinforced concrete foundation

1386-53 Details of walls

1387-53 Details of roof

1388-53 Details of timber doors

1389-53 Details of steel doors

1390-53 Floor duct covers.

6.2.4 Mobil Emergency Control Centres

In connection with the due functioning of the railways in war time, two mobile control office trains were operational 1955 /56, for use on the London Midland Region. They were to be used in the event of an existing peacetime or even an emergency control centre being put out of use by enemy action.

They were designed to operate from the nearest convenient point to a static control office where a connection could be made to telephone circuits with the object of maintaining the control organisation until such time as more permanent arrangements could be made.

Each 1956 train consisted of three, 57 ft long coaches converted to form:

- Generating and Mess Car – containing two engine generating sets (8 kW diesel-driven alternator sets furnishing a single-phase 230V, 50 cycle supply. Fuel was supplied from two under-floor 100 gallon capacity tanks plus a 40 gallon header tank. There was also a battery room, telephone switchboard room, telephone relay room, store room and mess room with seating for eight persons. Each member of the 30 man staff had an individual locker.
- Control Office Car – This vehicle was designed to cover the function of control room and was supplied with a continuous desk which ran practically the whole length of one side of the car for 13 persons made up of 9 section controllers, one each for rolling stock, engine and guards controllers. An additional desk was also provided at one end of the car for the Deputy Chief Controller, arranged at right-angles to the other desk to give a good view of the office. Each desk was fitted with a plug board to accommodate 40 battery ringing omnibus circuits. An exchange switchboard had facilities for ten Post Office or railway tie lines.
- District Operating Superintendent and Office Car – consisting of a centre-corridor third-class coach was adapted to for an office for the DOS and five assistants or heads of sections in one portion and eight clerks in the other. Existing seating was retained with the addition of new tables.

Following the conversion of three complete mobile control units, the idea appears to have been shelved until it came under review again at the end of 1961. The sum of £124,000 was authorised by the Treasury to expand the original scheme and this had to be spent by 31 March 1962.

It was agreed at a subsequent Railway Defence Planning meeting that two mobile controls would be required for each region, requiring another nine trains. Progress was very slow and the full amount was not spent and subsequently lost although the British Transport Commission did pay £400 for each of 36 coaches selected for conversion, as well as 18 diesel engine alternating sets for 9 new mobile controls as required before 31 March 1962.

Estimates were then prepared for the next financial year for the conversion of nine new trains and for the updating of the three existing controls. This was estimated at a total cost of £154,400, of which £49,800 had already been allocated in the last year, leaving £104,600 to be authorised in the 1962 / 63 financial year for a total of twelve mobile control trains (two on each region) to be completed by 1 January 1965. Actually it is believed the completion took a little while longer:

- Eastern Region completed by 28 March 1966
- Western Region completed by 5 April 1966
- North Eastern completed by 1 April 1966
- Scottish Region 2 mobile controls completed minus telephones by 7 March 1966
- Southern Region completed by 10 March 1966.

The first time mobile control centres were used for their intended purpose and under actual working conditions occurred during the rebuilding of the new static control centre at Newport from April to October 1962. At this point there were still only the three completed mobile controls, the one at Newport and the original two allocated to the London Midland Region. The following plant and equipment was required:

- 18 × 35 kW generator sets (2 per control) at £5,625 per train, supplied by Auto Diesels Ltd of Uxbridge
- 9 switchboards
- 180 CB telephones (20 per control)
- 120 miles of 20 pair interruption cable (10 miles for each of 12 controls)
- 80-gallon auxiliary fuel tank (some sources say 100-gallon) for each of the 2 generators per control.

Each four-car train consisted of the following:

- Control and Apparatus Coach – with ten built-in control desks in line down one side of the vehicle. Each desk was equipped with ten-line keyboard, one line designated a PO extension from the switchboard and the other nine for railway control lines brought in according to the circumstances of the time of bringing into use. An adjacent section was formed into a cubicle housing a telephone switchboard. The remaining 14 feet of vehicle housed control telephone apparatus racks. (Drawing 140175F)
- Office Coach – containing a cubicle at one end with desks to seat a District Officer and one assistant. The remainder of the coach was laid out with 14 built-in office desks in pairs, back-to-back and staggered along one side. (Drawing 140175F)
- Stores and Mess Room Coach – containing a small mess room with kitchen and locker room. The remaining section was used for storage including drums of telephone cable, interruption cable. Double doors were provided in the side of the vehicle for loading /unloading. (Drawing 140175F)
- Generator and Telephone Battery Coach – containing an electric power room equipped with two diesel engine generators plus a section containing telephone battery racks. (Drawing 140168A).

The conversion of the Eastern Region units was carried out at Doncaster, and those for the North Eastern Region at York. It was originally proposed to stable the mobile controls at:

- Eastern: Shenfield or Ipswich and Retford
- London Midland: Hellifield and Market Harborough
- North Eastern: Bolton Abbey and Berwick (Tweedmouth)
- Scottish: Carstairs and Stirling
- Southern: Salisbury and Tonbridge and Guildford
- Western: Westbury, Hereford and Honeybourne when a third mobile control becomes available.

In order to give a reasonable degree of security against destruction by enemy attack, there was a scheme towards the end of 1961, to lay by-pass cables around key centres, picking up all district control telephone lines. Multi-core cable would have to be laid around the perimeter some 10 miles from the centre and requiring around 60 miles of cabling. The 'shot' estimate was £135,816 per centre and £814,896 to cover all district control centres in the NE Region – it is thought that this idea came to nothing and was replaced at the end of 1964, when the Ministry of Transport authorised the payment for an additional 10 miles of interrupter cable. The extra cable required either a covered goods van to carry it although this would mean a speed restriction of 50 miles per hour, or another way would be to carry the whole 20 miles in a passenger brake van with no limit on speed. It is thought that the two mobile units stored at Retford, each received an ex-banana van dating from 1929, to carry the extra cable – they were scrapped in 1968 and 1975 respectively.

The NE Region was also authorised to install microwave VHF towers for the East Coast Main Line between York and Newcastle, for emergency use within 20 miles of each tower but this system was single channel only, restricted to one person being able to call at any one time. The region's two mobile controls were also to be fitted with VHF and carrier equipment at a cost of £2,000.

Following the merger of the Eastern and North Eastern Regions in 1967, the four mobile controls passed to the 'new' Eastern Region. Two units belonging to Eastern Region were stored from 1962 at Retford and for four years received no maintenance; in order to make them serviceable again, a figure of £3,000 for the eight vehicles was required. As the trains were Government sponsored, it was some time before they could be disposed of, but the Department of Transport took the decision to condemn them in July 1979 and the units were then put up for disposal. Seven of the 16 Eastern Region mobiles were scrapped, the others going to various preservation societies, but it is understood that none were preserved in their Civil Defence configuration. It is not known what became of the trains of the other regions.¹²

Vehicles Selected for Conversion, 23 Jan 1962										
Vehicle #	Year Built	Original Cost £		Vehicle #	Year Built	Original Cost £		Vehicle #	Year Built	Original Cost £
EASTERN										
SK 12262	1931	2,340		SK 12481	1931	3,392		SK 12726	1934	2,340
SK 12328	1935	2,803		TSO 13547	1935	2,298		TSO 13407	1935	2,353
TSO 13548	1935	2,298		TSO 13385	1935	?				
WESTERN										
2798	1937	1,031		5813	1934	1,689		5863	1935	1,689
9654	1936	3,314								
SOUTHERN										
1996	1922	651		2001	1922	651		3680	1929	1,820
3687	1931	1,734		5601	1931	1,989		5599	1931	1,966
3690	1931	1,734		3691	1931	1,735				
NORTH EASTERN										
SK 12322	1935	2,803		SK 12715	1936	2,803		SK 13320	1936	2,732
SK 13354	1934	2,353		SK 13317	1936	2,732		SK 12394	1937	2,735
SK 13273	1936	2,732		SK 12523	1935	2,306				
SCOTTISH										
SC 16187 E	1930	2,129		SC 16198 E	1928	2,442		SC 12934 E	1934	2,358
SC 12936 E	1934	2,358		SC 12937 E	1936	2,711		SC 12504 E	1931	2,735
SC 13254 E	1936	2,735		SC 13251 E	1936	2,735				

¹² Railway World, June 1981 – see Bibliography



Plate 47: The derelict condition of four of the Carstairs stabled mobile control rooms
Note the fuel tank under SC16198E which is the generator coach.



Plate 48: Coach TDE 320956 formally in the Newcastle mobile control set
Now assured of a future at Goathland on the Moors Railway, shown with its new owner Colin Sykes.

Plate 49: Interior of SC13254E
This coach is now owned by NRM (restored as 23956)

Photos: Murray Brown c.1981

Appendix I – Wartime Railway Emergency Control Centre Status, 2014

	Station	Type	Status	NGR
Great Western Railway	Paddington HQ	Existing Bldg	?	?
	Birmingham	?	?	?
	Cardiff	?	?	?
	Exeter St Davids	Existing Bldg	?	?
	Newport	Existing Bldg	?	?
	Plymouth	Existing Bldg	?	?
	Swansea	Existing Bldg	?	?
	Worcester	?	?	?
	Bristol	?	?	?
	Chester	A2	Removed	SJ 41390 66871
	Gloucester	?	?	?
	Oswestry	Existing Bldg	?	?
	Reading	?	?	?
	Swindon	?	?	?
LMS	Euston HQ	?	Existing Bldg	?
	The Grove, Watford	1943 design	Removed	?
LMS Western Division	Crew Division HQ	A1	Extant	SJ 71050 54591
	Birmingham New Street	A2	Existing Bldg	?
	Chester	A2	Removed	SJ 41390 66871
	Heaton Norris	B2	?	?
	Liverpool Lime Street	B2	?	?
	Patricroft	B2	Removed	SJ 76805 99062
	Rugby	B2	?	?
	Stoke on Trent	B2	?	?
	Wigan	A2	?	?
	Workington	B2	Removed	NX 99532 28878
	Barrow in Furness	B2	?	?
	Bletchley	B2	Removed	?
	Basford Hall (Crewe)	A1	Removed	SJ 71393 52959
	Lancaster	B2	?	?
	Nuneaton Abbey Street	B2	?	?
	Preston	B2	?	?
	Strafford	B2	?	?
	Warrington	B2	?	?
	Willesden Junction	A2	Removed	TQ 21869 82918
LMS Central Division	Manchester Victoria	A1	?	?
	Wakefield	?	?	?
	Huddersfield	B2	?	?

Wartime Railway Emergency Control Centre Status, 2014 (contd)

	Station	Type	Status	NGR
LMS Midland Division	Derby Division HQ	A1	?	?
	Bath Green Park	B2	?	?
	Chaddesden	A2	Removed	SK 37155 35990
	Fenchurch Street	A2	?	?
	Gowhole	B2*	Extant	SK 01392 83693
	Kirkby in Ashfield	Variant	?	?
	Leicester	?	?	?
	Melton Mowbray	B2*	Removed	SK 75427 18773
	Peterborough	B2*	Removed	TL 18432 99280
	Saltley	A2	Removed	SP 09229 87698
	Staveley	?	?	?
	Wellingborough	?	Extant	SP 90451 69412
	Burton on Trent	B2	?	?
	Cudworth	B2	Extant	SE 28365 08189
	Gloucester	B2	?	?
	Kentish Town	A2	?	?
	Leeds	A2	?	?
	Rotherham Masborough	A2	Extant	SK 41768 92559
	Nottingham		?	?
	Rowsley	B2*	Removed	SK 26138 64768
	Skipton		?	?
	Toton	A2	Extant	SK 48693 35001
	Westhouses	B2*	?	SK 312 58578
LMS Northern Division	Glasgow Buchanan St Division HQ	A1	?	NS 59242 66143
	Aberdeen	B2	?	?
	Edinburgh	B2	?	?
	Kilmarnock	B2	?	?
	Perth	Variant	?	?
	Glasgow St Rollox	A2	?	?
	Carlisle	B2	Extant	NY 40098 5550
	Inverness	B2	?	?
	Motherwell	A2	?	?
	Glasgow Polmadie	A2	?	?
Cheshire Lines Committee	Liverpool Central	?	?	?
LNER North Eastern Area	York HQ	?	?	?
	Darlington	?	?	?
	Newcastle	?	?	?
	West Hartlepool	?	Removed	NZ 51529 32751
	Hull	?	?	?
	Sunderland	?	?	?
	York (District)	City Walls	Extant	SE 59745 51720
LNER Scottish Area	Edinburgh HQ	?	?	?
	Aberdeen	Existing Bldg	?	?
	Coatbridge	Existing Bldg	?	?
	Glasgow	?	?	?
	Burntisland	Existing Bldg	?	?
	Edinburgh (District)	Tunnel	Extant	NT 25471 74818

Wartime Railway Emergency Control Centre Status, 2014 (contd)

	Station	Type	Status	NGR
LNER Southern Area	Kings' Cross HQ	?	?	?
	Liverpool Street HQ	New Bldg	?	?
	Marylebone HQ	?	?	?
	Bawtry	office	Removed	SK 65477 93944
	Doncaster	?	Extant	SE 57100 02817
	Gerrards Cross	office	Removed	SU 99537 89204
	Ipswich	?	Removed	TM 15898 43764
	Knebworth	office	Extant	TL 24914 20211
	Lincoln	?	?	?
	Metheringham	office	Removed	TF 07619 61446
	Nottingham	Existing Bldg.	?	?
	Whitegates, Shenfield	office	Extant	TQ 61836 95739
	Cambridge	Existing Bldg	Extant	TL 46160 57320
	East Leake	Office	Removed	SK 54769 26318
	Godley Junction	Office	Removed	SJ 96775 94781
	King' Cross District	?	?	?
	Leeds	Existing Bldg	?	?
	Manchester	Existing Bldg	?	?
	Norwich	Prefab	Removed	TG 61836 95739
	Stratford	?	?	?
Southern Railway	Exeter Central HQ	Existing Bldg	?	?
	Purley HQ	?	?	?
	Waterloo HQ	Existing Bldg	?	?
	Deepdene HQ	Cave	Extant	TQ 17318 49151
	London Bridge HQ	Existing Bldg	?	?
	Southampton Central HQ		?	?
	Wimbledon HQ	Existing Bldg	?	?
	Ashford	?	?	?
	Chatham	Existing Bldg	?	?
	Dover	Existing Bldg	?	?
	Eastleigh	?	?	?
	Newport	?	?	?
	Portsmouth	?	Removed	SU 42590 10956
	Redhill	?	Extant	TQ 28088 50317
	Woking	Existing Bldg	Extant	TQ 00857 58783
	Brighton	Tunnel	Extant	TQ 31054 04975
	Dartford	?	Removed	TQ 54311 74290
	Eastbourne	?	?	?
	Hastings	?	?	?
	Orpington	Underground	Extant	TQ 45464 66048
	Purley	?	?	?
	Southampton	Existing Bldg	Removed	SU 42590 10956

Appendix II – British Rail Cold War Railway Control Centres Status, 2014

Region	Location		Status	NGR
London Midland	London Euston / Bricket Wood	'L' Building	Extant	TL 13515 02062
	London St Pancras / St Albans	'L' Floor slab	Removed	TL 15638 06662
	Liverpool Central / Hough Green	'L' Floor slab	Removed	SJ 48760 86464
	Liverpool Lime Street / Huyton Junction	'L' Floor slab	Removed	SJ 45021 90757
	Manchester London Road / Wilmslow	'L' Floor slab	Removed	SJ 85106 81254
	Blake Street	'L' floor slab	Removed	SK 10722 00279
	Godley Junction	'L' floor slab	Removed	SJ 96847 94750
	Greenodd	'L' floor slab	Removed	SD31482 81941
	Hazelwood	?	?	?
	Idridgehay	'L' floor slab	?	SK29027 78644
	Langley Mill	'L' floor slab	?	SK44950 46874
	Milnrow,	'L' building	Removed	?
	Preston	?	?	?
	Tamworth	'L' Floor slab	?	SK 21350 04500
	Welton	?	?	?
Eastern	Rotherham / Dore & Totley	'L' Floor slab	Removed	SK 32333 81020
	Stratford & Fenchurch St / Whitegates, Shenfield	'L' Floor slab	Extant	TQ 61873 95790
	Knebworth	'L' Building	Removed	TL 24961 20376
	Doncaster / Bawtry	'L' Floor slab	Removed	SK 65445 93888
	Grantham	'L' Floor slab	Removed	SK 91344 34850
	Newmarket	Deferred	Not built	TL 64457 62754
	Wymondham	Deferred	Not built	-
North Eastern	Sunderland / Fencehouses	?	?	?
	Newcastle / Stocksfield	'L' Floor slab		NZ 05586 61491
	Hull / Market Weighton	'L' Floor slab	Removed	SE 87809 41935
Scottish	Glasgow / Burntisland	'L' Building	Extant	?
	Edinburgh / Ratho	'L' Floor slab	?	?
Southern	Southampton / Romsey	?	?	?
Western	Cardiff / Creigiau	?	?	?
	Newport / Triley (?)	?	?	?
	Birmingham Snow Hill / Widney Manor	?	?	?

Appendix III – Admin & Control Centres Estimates, Great Western Railway, 08-06-38

	Name	Category * VP	New Structures £	Adaption £	Electrical Equip £	Total £
Admin HQ	Paddington	A*	-	3,100	7,433	10,533
District Control	Birmingham	A*	9,750	-	5,389	15,139
	Bristol	A*	9,750	-	4,499	14,249
	Cardiff	A*	10,250	-	1,844	12,094
	Chester	B	-	1,800	672	2,472
	Exeter	B	-	1,000	1,027	2,027
	Gloucester	B	1,300	-	797	2,097
	Oswestry	B	-	500	512	1,012
	Newport	A*	-	1,500	1,447	2,947
	Plymouth	B*	-	2,400	1,702	4,102
	Reading	A*	7,600	-	1,542	9,142
	Swansea	A*	-	2,100	1,577	3,677
	Swindon	A*	9,750	-	1,822	11,572
	Worcester	B	1,300	-	1,417	2,717

Appendix IV – Admin & Control Centres Estimates, London & North Eastern Railway, 08-06-38

	Name	Category * VP	New Structures £	Adaption £	Electrical Equip £	Total £
SOUTHERN AREA						
Admin HQ	King's Cross	A*	9,100	-	460	9,560
	Marylebone	A*	9,000	-	460	9,460
	Liverpool Street	A*	-	6,000	3,410	9,410
District Control	Cambridge	B	-	1,500	1,880	3,380
	Doncaster	A*	9,050	-	3,080	12,130
	Ipswich	B	1,020	-	1,330	1,350
	King's Cross	A*	9,200	-	3,650	12,850
	Leeds	A*	-	6,000	1,780	7,780
	Lincoln	A*	6,840	-	1,780	8,620
	Manchester	A*	-	7,700	1,680	9,380
	Norwich	B	1,300	-	1,630	2,930
	Nottingham	A*	-	8,000	1,880	9,880
	Stratford	A*	8,775	-	3,685	12,460
NORTH EASTERN AREA						
Admin HQ	York	A*	9,750	-	2,400	12,150
District Control	Darlington	A*	9,750	-	3,050	12,800
	Hull	A*	9,750	-	2,500	12,300
	Newcastle	A*	9,750	-	3,900	13,650
	Sunderland	A*	9,750	-	2,300	12,050
	West Hartlepool	A*	7,600	-	1,200	8,800
	York	A*	9,750	-	3,400	13,150
SCOTTISH AREA						
Admin HQ	Edinburgh	A*	-	-	-	2,885?
District Control	Aberdeen	B	-	350	-	350
	Burntisland	B	-	200	-	200
	Coatbridge	A*	-	300	-	300
	Edinburgh	A*	-	250	-	250
	Glasgow	A*	-	-	-	500?

Appendix V – Admin & Control Centres Estimates, London, Midland Scottish Railway, 08-06-38

	Name	Category * VP	New Structures £	Adaption £	Electrical Equip £	Total £
Admin HQ	Euston	A*		5,450	4,500	9,950
WESTERN DIVISION						
Div Control	Crewe	A*	10,100		3,664	13,764
District Control	Barrow	B	1,120	-	874	1,994
	Birmingham New St	A*	7,800	-	1,905	9,705
	Bletchley	B	1,120	-	874	2,433
	Chester	B	-	800	1,313	2,113
	Crewe, Basford Hall	A*	7,800	-	923	8,723
	Heaton Norris	B*	-	700	874	1,574
	Lancaster	B	-	500	923	1,423
	Liverpool Lime St	A*	6,000	-	1,856	7,856
	Nuneaton	B	-	500	923	1,423
	Patricroft	B*	1,400	-	874	2,274
	Preston	B*	-	500	1,856	2,356
	Rugby	B*	-	500	1,856	2,356
	Stafford	B	1,400	-	1,313	2,713
	Stoke	B*	-	1,650	1,313	2,963
	Swansea	B*	-	1,000	1,797	2,797
	Warrington	B*	-	500	1,856	2,356
	Wigan	A*	-	1,600	1,264	2,864
	Willesden	A*	7,800	-	1,313	9,113
	Workington	B	1,120	-	874	1,994
CENTRAL DIVISION						
Div Control	Manchester Victoria	A*		3,600	2,594	6,194
District Control	Huddersfield	B*	-	1,270	1,264	2,534
	Wakefield	B*	1,400	-	874	2,274

contd/

Admin & Control Centres Estimates, London, Midland Scottish Railway, 08-06-38 (contd)

	Name	Category * VP	New Structures £	Adaption £	Electrical Equip £	Total £
MIDLAND DIVISION						
Div Control	Derby	A*	10,100	Nil	3,072	13,172
District Control	Bath	B	-	500	874	1,374
	Burton-on-Trent	B	-	700	874	1,574
	Chaddesden	A*	6,000	-	874	6,874
	Cudworth	B	1,400	-	874	2,274
	Fenchurch Street	A*	7,800	-	874	8,674
	Gloucester	B	1,120	-	874	1,994
	Gowhole	B	1,400	-	923	2,323
	Kentish Town	A*	-	2,477	1,123	3,600
	Kirkby-in-Ashfield	B	1,120	-	874	1,994
	Leeds	A*	-	700	1,264	1,964
	Leicester	B*	-	800	1,313	2,113
	Masborough / Rotherham	A*	6,000	-	874	6,874
	Melton Mowbray	B	1,120	-	874	1,994
	Nottingham	B*	1,400	-	1,264	2,664
	Peterborough	B	1,120	-	874	1,994
	Rowsley	B	1,400	-	874	2,274
	Saltley	A*	7,800	-	923	8,723
	Skipton	B	1,120	-	874	1,994
	Staveley	B	1,400	-	874	2,274
	Toton	A*	6,000	-	874	6,874
	Wellingborough	B	1,400	-	923	2,323
	Westhouses	B	1,400	-	874	2,274
NORTHERN DIVISION						
Div Control	Glasgow, Buchanan St	A*	7,700	-	1,474	9,174
District Control	Aberdeen	B	1,120	-	923	2,043
	Carlisle	A	6,000	-	1,905	7,905
	Edinburgh	A*	7,800	-	923	8,723
	Inverness	B	1,120	-	923	2,043
	Kilmarnock	A	7,800	-	923	8,723
	Motherwell	A*	7,800	-	923	8,723
	Perth	B	1,400	-	923	2,323
	Polmadie	A*	6,000	-	923	6,923
	St Rollox	A*	7,800	-	923	8,723
CHESHIRE LINES COMMITTEE						
	Liverpool Central	A*	6,000		1,313	7,313

Appendix VI – Admin & Control Rooms Estimates, Southern Railway, 08-06-38

Name	Category * VP	New Structures £	Adaption £	Electrical Equip £	Total £
ADMINISTRATIVE HEADQUARTERS					
Waterloo	A*	-	28,200	22,350	50,550
London Bridge	A*	-	12,200	1,900	14,100
Exeter Central	C	-	500	320	820
Purley	B*	1,950	-	210	2,160
Southampton Central	B*	2,600	-	110	2,710
Wimbledon	C*	-	1,040	70	1,110
CONTROL CENTRES					
Southampton	A*	15,800	-	7,250	23,050
Ashford	B*	1,620	-	550	2,170
Brighton	B	-	2,430	6,210	8,640
Chatham	B*	-	490	390	880
Dartford	B*	1,650	-	170	1,820
Dover	B*	-	1,590	3,380	4,970
Eastleigh	B*	3,000	-	880	3,880
Orpington	B*	1,770	-	300	2,070
Portsmouth	B*	2,700	-	590	3,290
Woking	B*	1,650 shared	1,650 shared	210	1,860
TELEPHONE EXCHANGES					
Basingstoke	C*	-	230	200	430
Bournemouth	C	-	370	50	420
East Croydon	C*	-	920	420	1,340
Faversham	C	-	420	80	500
Feltham	C*	-	280	160	440
Guildford	C*	-	400	80	480
Margate	C	-	370	60	430
Redhill	C*	-	370	60	430
Salisbury	C	-	360	230	590
Tonbridge	C*	-	850	160	1,010
Emergency control centres at Eastbourne, Hastings, Newport (IoW) and Purley were not included in this list					

Appendix VII – Vital Points Admin & Control Centres, London Passenger Board – Estimates (June 1938)

	Name	Category * Vulnerable Area	New Structure	Adaption £	Electrical Equip £	Total £
Headquarters	Westminster	B*	-	400	200	600
Administrative Centres	Leicester Square (Central Control)	A*	-	2,000	3,000	4,000
	Baker Street	A*	-	1,500	1,000	2,500
	Earls Court	A*	-	1,500	1,000	2,500
	Oxford Circus	A*	-	200	200	400
	Leicester Square	A*	-	100	300	400
Automatic Junction Exchanges	Acton Town	B*	1,200	-	800	2,000
	Aldgate	B*	1,200	-	800	2,000
	East Finchley	B*	1,200	-	800	2,000
	Finsbury Park	B*	-	1,500	1,000	2,500
	Golders Green	B*	1,200	-	800	2,000
	Harrow-on-the-Hill	B	1,200	-	800	2,000
	Loughton	B	1,200	-	800	2,000
	Protecting existing controller's offices	-	-	-	-	1,600
	Total	-	7,200	7,200	11,500	27,500

Appendix VIII – Estimates for Control Rooms

Item	Cost (£)	Kentish Town	Willesden	Derby	Manch'r	Masboro'	Saltley	Bletchley	Stafford
Excavation		4,260	1,650	2,250	6,470	160	160	30	30
Concrete		3,000	4,430	3,610	4,700	3,100	3,100	430	430
Reinforcement		3,600	5,250	4,150	5,330	3,600	3,600	230	230
Sand Filling		230	350	350	360	230	230	Nil	Nil
Standby Gen & Ventilation		530	630	670	670	530	530	530	530
Doors		280	190	310	310	280	280	280	280
Telephone & Equipment		625	950	2,885	2,505	580	670	733	733
External Cabling		242	460	530	2,142	70	220	330	315
Furniture		68	80	165	213	60	60	62	62
Total		£12,835	£13,990	£14,880	£22,900	£8,610	£8,850	£2,625	£2,610
Original Estimate			£9,113	£13,172	£6,194	£6,874	£8,723	£2,433	£2,713

Appendix IX – Construction only projects

Control Rooms (less furniture and telephone exchange)

LMS projects submitted on 3 January and approved 3 April 1939

Glasgow Buchanan Street, £12,232	Motherwell, £8,960
Polmadie, £8,720	St Rollox, £9,160

LMS projects submitted on 27 March and approved on 30 March 1939

Cudworth, £2,185	Fenchurch Street, £2,802
Kentish Town, £12,767	Patricroft, £2,047
Staveley, £2,282	Wellingborough, £2,205

LMS projects submitted on 15 April 1939 and approved 4 days later

Carlisle, £10,300	Chaddesden, £8,680
Euston, £10,250,	Heaton Norris, £1,915
Stoke on Trent, £3,223	Wakefield, £2,311

LMS projects submitted on 17 May and approved on 31 May 1939

Burton, £2,193	Leeds, £5,640
Birmingham New Street, £5,060	Huddersfield, £2,489
Leicester, £2,122	Liverpool Lime Street, £2,385
Nuneaton, £1,549	Preston, £2,187
Rugby, £2,757	Warrington, £1,938
Wigan, £6,193	
Liverpool Central (LMS) (Cheshire Lines Committee) £2,246 date 01-06-39	

Notes:

Glasgow, Kentish Town, Motherwell and St Rollox had extensive excavation, concrete, reinforcement and sand filling.

Cudworth, Fenchurch St, Glasgow, Kentish Town, Motherwell, Patricroft, Polmadie, St Rollox, Staveley and Wellingborough all had stand-by generators and ventilation.

Details for the other sites are unknown.

GWR Projects approved on various dates

Worcester £6,250, (11-05-39)	Plymouth £6,450, (31-05-39)
Exeter £5,350, (15-06-39)	Gloucester £4,280, (04-07-39)

LNDR Dispersed Projects approved 9 February 1939

Manchester DC to Godley £10,516	Liverpool St Western HQ to Gerrards Cross £6,579
Nottingham DC to East Leake £18,170	Leeds DC to Drighlington £3,782
Lincoln DC to Blankney & Metherringham £7,544	Doncaster DC to Bawtry £17,820
King's Cross DC to Knebworth £19,038	Ipswich TWO (?) to Ipswich £889
Norwich TWO to Norwich £1,828	Cambridge TCO (?) to Cambridge £2,220
Liverpool St Eastern HQ and Stratford to Shenfield £23,807	

LNDR Non-Dispersed Projects approved 9 February 1939

York HQ £14,564	York DC £11, 552	Hull DC £13,504
Darlington DC £14,598	West Hartlepool DC £8,903	Sunderland DC £12,322
Newcastle DC £13,797		

SR Projects

Purley (SR) £4,290 15-03-39 (DE admin)

Appendix X – Defence of the Railway

In 1941, the Home Guard detachments of the LMS, GWR and Cheshire Lines Committee (CLC) railways became 'F' Company of the 6th Cheshire (Chester) Battalion; they were responsible for the defence of railway property throughout the county. The scheme adopted for the administration of the Railway formations was similar to that of the Post Office, except for shape and disposition of the area in which they functioned – this being the property of the railway. For example, all HG personnel of the LMS were attached to a single zone, extending from London to Glasgow, with Battalion Commands at suitable points along the line. This was known as the LMS Zone and part of its length running through Cheshire was the responsibility of 'F' Company. As with the Post Office, Railway HG units were attached for operational purposes to local general service battalions. Unfortunately companies, platoons and sections often found themselves distributed through many miles of country, owing to the way they were stretched along the railway line – although restricted to a very narrow band. The dispersed control rooms and offices at Bletchley and Shenfield / 'Whitegates' were both protected with one or more thin-walled pillboxes constructed on the roof and at Whitegates there is an HG guard-house close to the entrance to the site.



Plate 50: Home Guard building at the entrance to Whitegates

Appendix XI – Duplication of Facilities Installed as an ARP Measure: Emergency Control Centres

	Location	PBX # of Operating Positions	Extension Telephones	Controller's Panels	Other Telephones	Teleprinters (tg=telegraph)
Great Western Railway	Paddington	4	70	1	3	1
	Reading	4	-	2	-	1
	Bristol	2	53	2	-	-
	Exeter	1	43	1	-	-
	Plymouth	2	50	1	-	-
	Newport	2	33	2	-	-
	Cardiff	2	57	2	-	-
	Swansea	2	65	4	-	-
	Gloucester	1	36	1	-	-
	Worcester	1	39	1	-	-
	Birmingham	2	40	2	-	-
	Chester	-	15	1	-	-
London Midland & Scottish Railway, Western Division	Crewe Div Control	2	20	8	1	-
	Willesden	1	11	7	10	-
	Bletchley	1	-	3	3	-
	Rugby	1	5	3	5	-
	Nuneaton	1	-	3	2	-
	Birmingham New St	1	22	7	-	3
	Stafford		1	3	-	-
	Stoke on Trent	1	6	4	-	-
	Basford Hall Crewe	-	-	4	3	-
	Warrington	1	16	3	-	-
	Wigan	1	6	4	1	-
	Preston		8	3	1	-
	Heaton Norris	1	-	3	2	-
	Patricroft	-	-	2	2	-
	Liverpool Lime Street	1	9	3	1	-
	Chester	1	37	3	1	-
	Lancaster	1	-	5	1	-
	Barrow in Furness	1	-	4	2	-
	Workington	-	-	6	-	-
London Midland & Scottish Railway, Northern Division	Glasgow Division	2	18	7	-	-
	Carlisle	1	-	5	-	-
	Motherwell	-	-	5	-	-
	Edinburgh	-	-	2	1	-
	Kilmarnock	-	-	4	-	-
	Polmadie	-	-	5	-	-
	St Rollox	-	-	5	-	-
	Inverness	1	-	3	-	-
	Forfar	-	-	1	5	- + 1 tg
	Aberdeen	-	-	-	3	-

Duplication of Facilities Installed as an ARP Measure: Emergency Control Centres (contd)

	Location	PBX # of Operating Positions	Extension Telephones	Controller's Panels	Other Telephones	Teleprinters (tg=telegraph)
LMS Central Division	Manchester Div Control	-	-	16	4	-
	Huddersfield	1	12	4	-	-
	Wakefield	-	-	4	1	-
LMS Western Division	Derby DivControl	2	6	8	-	3
	Fenchurch Street	-	-	2	13	-
	Kentish Town	-	-	5	5	-
	Wellingborough	-	-	4	-	-
	Leicester	1	5	4	1	-
	Peterborough	-	-	4	-	- + 2 tg
	Melton Mowbray	-	-	3	-	-
	Nottingham	1	4	4	-	-
	Toton	-	-	5	-	-
	Kirkby-in-Ashfield	-	-	5	-	-
	Westhouses	-	-	5	-	-
	Staveley	-	-	3	-	-
	Rotherham Masboro'	-	-	4	2	-
	Cudworth	-	-	4	-	-
	Leeds City	2	4	4	-	-
	Skipton	-	-	4	-	-
	Gowhole	-	-	4	1	-
	Rowsley	-	-	4	1	-
	Chaddesden	-	-	4	1	-
	Burton-on-Trent	1	3	4	2	-
	Saltley	-	-	6	2	-
	Gloucester	-	-	4	-	-
	Bath	-	-	4	12	-
LNER	Bawtry	2	9	-	19	- + 1 tg
	Godley	1	30	-	-	-
	Knebworth	1	41	-	-	-
	Shenfield	1	66	-	-	-
	Edinburgh	1	36	-	25	-
	Coatbridge	1	19	-	-	-
	Glasgow Queen Street	1	40	-	4	-
	Hull	1	-	-	1	-
	Darlington	1	-	-	1	-
	Newcastle	1	-	-	1	-
	West Hartlepool	1	-	-	1	-
	Drighlington	-	-	-	8	-
	Blankney	1	-	-	10	-
	East Leake	1	-	-	10	-
	Gerrard's Cross	1	59	-	7	-
	Grimsby Docks	-	-	-	4	-
	Sunderland	-	-	-	1	-
Note that Western District Control moved from Coatbridge to Glasgow during June 1941						

Duplication of Facilities Installed as an ARP Measure: Emergency Control Centres (contd)

	Location	PBX # of Operating Positions	Extension Telephones	Controller's Panels	Other Telephones	Teleprinters (tg=telegraph)
Southern Railway	Ashford	1	40	-	2	-
	Basingstoke	-	-	-	5	-
	Bournemouth	-	-	-	2	-
	Brighton	2	60	-	9	-
	Chatham	1	16	-	5	-
	Dartford	1	10	-	3	-
	Dover Marine	2	50	-	3	-
	East Croydon	1	33	-	5	-
	Eastleigh	-	-	-	13	-
	Faversham	-	-	-	4	-
	Feltham	-	-	-	4	-
	Guildford	-	-	-	7	-
	Portsmouth	1	36	-	6	-
	Salisbury	-	-	-	4	-
	Southampton Terminus	4	-	-	1	-
	Tonbridge	-	-	-	6	-

Appendix XII – Protection of Power-Stations and Sub-Stations

Power Houses		Cost £	Sub-Stations	Cost £
Great Western Railway	Nil	Nil	67	6,000
London & North Eastern Railway	1 Whitemoor 520 kw	150	Main 14, plus smaller stations	9,850
London Midland & Scottish Railway	Stonebridge Park 52,500 kw	9,700	145	15,600
	Formby 21,500 kw	3,700		
	Derby 8,000 kw	2,000		
Southern Railway	Durnsford Road 52,500 kw	5,400	152	19,600
London Passenger Transport Board	Lots Road 187,500 kw	19,000	Railways 71, plus smaller stations	81,000
	Greenwich 140,000 kw	14,000	Trams & Trolley buses 79	40,000
	Neasden 87,000 kw	12,000		
	Duplication of Control Rooms		Lots Road	40,000
			Greenwich	25,000
			Neasden	16,000

Appendix XIII – Demolition



Plate 51: The wall and roof burster layer voids over the emergency exit air-lock



Plate 52: The emergency exit air-lock which can be seen below right



Plate 53: View showing the three layers

The thin slab between the burster and the sand is a blinded course from which the reinforcement is laid.
Note that this has sunk, due to the loss of sand during demolition.



Plate 54: General view of the demolition site



Plate 55: A last look at the control room



Plate 56: A tangled mess of rebar, concrete and sand



Plate 57: The demolition process



Plate 58: Hydraulic hammer in action

Appendix XIV – List of Known Railway Bunkers

Basford Hall, Crewe	95	Langley Mill	124
Bawtry I	96	Market Weighton	125
Bawtry II	97	Melton Mowbray.....	126
Blake Street	98	Metherringham.....	127
Bricket Wood.....	99	Milnrow	128
Brighton.....	100	Norwich	129
Cambridge	101	Orpington	130
Carlisle	102	Patricroft	131
Chaddesden.....	103	Peterborough	132
Chester	104	Portsmouth.....	133
Crewe	105	Redhill.....	134
Cudworth.....	106	Rotherham	135
Dartford.....	107	Rowsley	136
Deepdene	108	Saltley	137
Doncaster	109	Shenfield I.....	138
Dore & Totley	110	Shenfield II.....	139
East Leake	111	Southampton.....	140
Gerrards Cross.....	112	St Albans.....	142
Godley Junction I.....	113	Stocksfield	143
Godley Junction II.....	114	Tamworth	144
Gowhole	115	Toton	145
Grantham	116	Wellingborough.....	146
Greenodd	117	West Hartlepool	147
Hough Green	118	Westhouses	148
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BASFORD HALL, CREWE**1. LOCATION**

Grid Reference (NGR) SJ 71393 52959		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Basford Hall (Crewe) Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The structure was located adjacent to the south end of Basford Hall Sidings, in open fields to the west of the rail lines.		
Current County/Unitary Authority Cheshire East	Current Parish/Borough/Community Crewe	Postcode CW2 5AA
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) ARP Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A rectangular concrete structure of similar size and shape to other known LMS Type A2 Railway District Emergency Control Centres can be identified in a February 1948 oblique aerial photo, with a semi-buried air raid shelter alongside to the south. (http://www.britainfromabove.org.uk/image/eaw013313) The structure has since been replaced by a modern three-storey office block.		
Construction materials Reinforced concrete		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

BAWTRY I**1. LOCATION**

Grid Reference (NGR) SK 65445 93888		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Bawtry Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Bawtry Station NMR 501244 Bawtry Railway District Emergency Control Centre NGR SK 65477 93944		
Location notes/directions The building stood in what is now the back gardens of 25 and 27 Sandbeck Court, Bawtry		
Current County/Unitary Authority Doncaster	Current Parish/Borough/Community Bawtry	Postcode DN10 6XP
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction c.1954 Source for dates TNA files within AN2	Dates for use
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), intended as the dispersed location for the Doncaster control room. 1962–63 1/2500 OS mapping shows the building to have been orientated N/S along its longer axis, and as the internal walls are shown it would appear construction was abandoned before completion. A WWII LNER District Emergency Control Centre stood 25m to the NE. Both buildings have been removed and the entire station site redeveloped for housing and business purposes.		
Construction materials Reinforced concrete		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

BAWTRY II**1. LOCATION**

Grid Reference (NGR) SK 65477 93944		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Bawtry Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Bawtry Station NMR 501244, Bawtry Railway District Control Building NGR SK 65445 93888		
Location notes/directions The structure was located at the north end of the station's goods yard, now occupied by the Bawtry Business Park.		
Current County/Unitary Authority Doncaster	Current Parish/Borough/Community Bawtry	Postcode DN10 6XN
NMR No. (if site known) 1476695	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A rectangular structure aligned roughly NNE along its long axis is visible on 1960–80s large-scale OS maps, measuring approximately 8m × 50m. An LNER diagram of the station layout between 1939 and 1943 identifies this as the control office with a radio hut near its southern corner. A photo of the site taken after the station closed in 1965 shows the building resembles the brick-built control rooms built by the LNER at Kenilworth and Shenfield. (http://signalboxes.com/resources/bawtry%20shows%20haxey%20line%20to%20right.jpg) A 1950s Railway District Control Building Type L stood 25m to the SW at SK 65445 93888. Both structures have since been demolished.		
Construction materials Brick, reinforced concrete		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

BLAKE STREET**1. LOCATION**

Grid Reference (NGR) SK 10722 00279		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Blake Street Railway District Control Building			
Alternative names			
Related sites (with NGRs if known) Blake Street Station NMR 507215			
Location notes/directions The site was at what is now the northern end of Balmoral Road, Sutton Coldfield, roughly centred where No.54 now stands.			
Current County/Unitary Authority West Midlands	Current Parish/Borough/Community Sutton Coldfield	Postcode B74 4UF	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction c.1954 Source for dates TNA files within AN2	Dates for use
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1962–65 1/2500 OS mapping shows only the floor slab of the building was completed, on the west site of the railway some 750m south of the Hill Hook Road bridge aligned parallel to the tracks. The area was then primarily open fields, but has since been extensively built up with housing.		
Construction materials Reinforced concrete		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

BRICKET WOOD**1. LOCATION**

Grid Reference (NGR) TL 13515 02062		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Bricket Wood Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The building stands at the north-east end of the Bricket Wood Station car park, in the trees between the station and Railway Cottages.		
Current County/Unitary Authority Hertfordshire	Current Parish/Borough/Community Bricket Wood	Postcode AL2 3PE
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction c.1954 Source for dates TNA files within AN2	Dates for use	
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), intended as the dispersed location for the London Euston control room. Of reinforced concrete construction, it has a single protected doorway in each of the shorter walls. This would appear to be the sole surviving example of this type in England, one other survives in Scotland at Burntisland.			
Construction materials Reinforced concrete.			
Overall condition Good	Converted		Restored
Threat type	Threat significance	Threat timescale	

BRIGHTON**1. LOCATION**

Grid Reference (NGR) TQ 31054 04975		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Brighton Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Brighton Station NMR 501089			
Location notes/directions The control room is beneath the station in a former goods tunnel.			
Current County/Unitary Authority East Sussex	Current Parish/Borough/Community Brighton	Postcode BN1 3XP	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway Division Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939 onwards
Site description and features The control room was constructed within a pre-existing tunnel beneath the platforms, previously used to transport goods between the high and low goods yards. In recent years the control room sections have been used for storage. For internal photos of the site see: http://pastfinders.com/sussexhistory/bton_goods_tunnel.htm http://www.semgonline.com/location/btonbs_02.html		
Construction materials		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

CAMBRIDGE**1. LOCATION**

Grid Reference (NGR) TL 46160 57320		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Cambridge Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Cambridge Station NMR 371296			
Location notes/directions The structure stands in the north corner of the forecourt of Cambridge railway station.			
Current County/Unitary Authority Cambridgeshire	Current Parish/Borough/Community Cambridge		Postcode CB1 2TZ
NMR No. (if site known)	HER/SMR No. MCB16538		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45		
Site description and features The emergency control centre was constructed in the semi-sunken basement floor of a pre-existing three-story railway building in the station forecourt, with a protected entrance porch on the NW end. The building is currently in use as an hotel, however planning permission has been granted for its complete demolition as part of a larger station area redevelopment scheme.				
Construction materials Brick with steel shutters over the basement window openings				
Overall condition Good	Converted	✓	Restored	✓
Threat type Demolition	Threat significance High		Threat timescale Active	

CARLISLE**1. LOCATION**

Grid Reference (NGR) NY 40098 55508		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Carlisle Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The structure is located in a car park at Carlisle Railway Station, adjacent to the Victoria Viaduct at the James Street end.			
Current County/Unitary Authority Cumbria	Current Parish/Borough/Community City of Carlisle		Postcode CA3 8AH
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) ARP Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Rectangular concrete structure aligned roughly ENE along its long axis, measuring approximately 10m × 15m. The surface of the surrounding ground has been built up since construction, and the building is now partially buried.		
Construction materials Reinforced concrete.		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

CHADDESSEN**1. LOCATION**

Grid Reference (NGR) SK 37155 35990		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Chaddesden Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions 125m due south of the Chequers Road / Downing Road junction.		
Current County/Unitary Authority Derbyshire	Current Parish/Borough/Community Derby	Postcode DE21 6HA
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Post-war 1/2500 OS mapping shows a rectangular concrete structure roughly 10m × 15m, aligned E/W along its long axis among railway buildings on the north side of the former Chaddesden Sidings. A 1946 oblique aerial image shows the structure to have a doorway in the south wall, at the eastern end: (http://www.britainfromabove.org.uk/image/eaw002485) The structure appears similar to the known examples at Carlisle and Rotherham, the position of the visible doorway and the overall dimensions of the structure matches the LMS design drawings for a Type A2 Emergency Control Room. The building has since been demolished and the site cleared.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

CHESTER**1. LOCATION**

Grid Reference (NGR) SJ 41390 66871		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Chester Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Chester General Station NMR 497479			
Location notes/directions The structure was located in a car park at the SW end of Chester Railway Station, adjacent to Queen's Road.			
Current County/Unitary Authority Cheshire West and Chester	Current Parish/Borough/Community Newtown, Chester	Postcode CH1 3DR / 3BQ	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) ARP Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Rectangular concrete structure aligned roughly NNE along its long axis, measuring approximately 10m × 19m. The structure was demolished in March 2014. For full details see the 2014 site report by Paul Francis for Cheshire West and Cheshire Council.		
Construction materials Reinforced concrete.		
Overall condition Destroyed	Converted	Restored
Threat type	Threat significance	Threat timescale

CREWE**1. LOCATION**

Grid Reference (NGR) SJ 71050 54591		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Crewe Railway Division Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Crewe Railway Station			
Location notes/directions The structure is located in a car park between the tracks to the west of Crewe railway station, accessed from the Nantwich Road bridge.			
Current County/Unitary Authority Cheshire East	Current Parish/Borough/Community Crewe	Postcode CW2 6HR	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway Division Emergency Control Centre (LMS) ARP Type A1	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Rectangular concrete structure aligned roughly NNW along its long axis, measuring approximately 11m × 19m.		
Construction materials Reinforced concrete.		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

CUDWORTH**1. LOCATION**

Grid Reference (NGR) SE 38365 08189		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Cudworth Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Cudworth Railway Station NMR 5014256			
Location notes/directions The structure is located on the NE side of the former Cudworth railway station site, to the south of the houses on Newland Avenue. The stone-built base of the station water tower stands some 100m to the SSW.			
Current County/Unitary Authority Barnsley	Current Parish/Borough/Community Cudworth	Postcode S72 8XB	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LMS)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45	
Site description and features A rectangular structure is visible on aerial imagery aligned roughly NNW along its long axis, measuring approximately 12m × 6m.			
Construction materials			
Overall condition	Converted		Restored
Threat type	Threat significance	Threat timescale	

DARTFORD**1. LOCATION**

Grid Reference (NGR) TQ 54311 74290		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Dartford Railway Divisional Emergency Control Room		
Alternative names		
Related sites (with NGRs if known) Dartford Station NMR 501361		
Location notes/directions The control room site is now occupied by the southern wing of Dartford Civic Centre.		
Current County/Unitary Authority Kent	Current Parish/Borough/Community Dartford	Postcode DA1 1BP / 1DZ
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A semi-buried emergency control room can be identified within the former goods yard to the south of Dartford station in a 1946 oblique aerial photo. (www.britainfromabove.org.uk/image/eaw001395) An L-shaped mound covering the structure can be seen on the 1962 1/2500 OS map.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

DEEPDENE**1. LOCATION**

Grid Reference (NGR) TQ 17318 49151		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Deepdene Southern Railway Headquarters Emergency Control Room		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site is constructed in caves leading into the SW side of a small valley, situated 110m to the SE of the Kuoni offices.		
Current County/Unitary Authority Surrey	Current Parish/Borough/Community Dorking	Postcode RH5 4AZ
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Headquarters Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–1960+
Site description and features For details see http://www.subbrit.org.uk/rsg/sites/d/deepdene_house/index.html		
Construction materials Steel, brick and reinforced concrete.		
Overall condition Very Poor	Converted	Restored
Threat type	Threat significance	Threat timescale

DONCASTER**1. LOCATION**

Grid Reference (NGR) SE 57100 02817		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Doncaster Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Doncaster Central Station NMR 501264		
Location notes/directions The structure is located on the west side of the rail tracks to the immediate south of Doncaster station and some 80 metres north of St. James' Bridge.		
Current County/Unitary Authority South Yorkshire	Current Parish/Borough/Community Doncaster	Postcode DN1 1AQ
NMR No. (if site known) 1476697	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A rectangular structure is visible on aerial imagery aligned roughly north/south along its long axis, measuring approximately 16m × 6m.		
Construction materials Brick and concrete		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

DORE & TOTLEY**1. LOCATION**

Grid Reference (NGR) SK 32333 81020		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Dore & Totley Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Dore & Totley Station NMR 510267		
Location notes/directions The site is on the western side of a triangle of tracks formed between the Dore Station, Dore South and Dore West Junctions, on the east of the line 110m south of Twentywell Lane bridge.		
Current County/Unitary Authority South Yorkshire	Current Parish/Borough/Community Dore	Postcode S17 4QD
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site	Date/s of construction	Dates for use		
Protected railway control room (BR Eastern Region) Standard District Control Building Type L	1954 Source for dates TNA files within AN2			
Site description and features				
<p>The outline of a post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on the 1958–60 1/2500 OS map.</p> <p>Dore & Totley was intended as the dispersed location for the Rotherham control room. The same outline continues to be shown on current large-scale OS mapping.</p> <p>Although the location was hidden by trees for many years, clearance works since 2005 have exposed the site to aerial view. No trace of a complete structure can be seen, although a faint outline matching that seen on the OS map is visible now the plant life is returning which may be possible evidence of a surviving buried floor slab. It is quite possible that work ceased before the building was completed, and the floor was all that was actually constructed.</p> <p>Ground-level imagery shows nothing standing above the surface on the site.</p> <p>(http://www.flickr.com/photos/30120216@N07/5088843847)</p>				
Construction materials				
Reinforced concrete.				
Overall condition	Converted		Restored	
Demolished				
Threat type	Threat significance		Threat timescale	

EAST LEAKE**1. LOCATION**

Grid Reference (NGR) SK 54769 26318		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site East Leake Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) East Leake Station NMR 509001			
Location notes/directions The structure was located within the station's goods yard, currently occupied by modern housing along Rope Walk.			
Current County/Unitary Authority Nottinghamshire	Current Parish/Borough/Community East Leake		Postcode LE12 6NR
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45 Retained for post-war use
Site description and features A rectangular structure is visible on large-scale post-war OS maps aligned roughly NNE along its long axis, measuring approximately 40m × 9m. Although this is far larger than any of the other known LNER emergency control rooms, a photograph of the site in the 1980s shows the northern end of this to be similar to the Metherringham example, so it may have been at one end of a range of buildings shown on the map as a single entity.		
Construction materials Brick and concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

GERRARDS CROSS**1. LOCATION**

Grid Reference (NGR) SU 99537 89204		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Gerrards Cross Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The structure was built into the north side of the railway cutting, to the immediate east of the Bull Lane bridge.			
Current County/Unitary Authority Buckinghamshire	Current Parish/Borough/Community Gerrards Cross		Postcode SL9 8QH
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

GODLEY JUNCTION I**1. LOCATION**

Grid Reference (NGR) SJ 96775 94781		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Godley Junction Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Godley Junction Station NMR 499109		
Location notes/directions The structure is a conversion of an existing railway engineers' depot building on the north side of Godley Junction, running alongside Godley Hill Road.		
Current County/Unitary Authority Cheshire	Current Parish/Borough/Community Hyde	Postcode SK14 3BJ
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A conversion of part of the pre-war railway engineers' depot, the pitched roof being removed and replaced with a flat concrete slab. Openings in the north wall are protected by metal frames with hinged plates. Reports from 2012 indicate it is intended to demolish the entire range of depot buildings to create a car park.		
Construction materials Stone walls with reinforced concrete roof, metal window frames and shutters.		
Overall condition Fair	Converted	Restored
Threat type Demolition	Threat significance High	Threat timescale Active

GODLEY JUNCTION II**1. LOCATION**

Grid Reference (NGR) SJ 96847 94750		NGR Location Point Centre of building	
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html			
Official name of site Godley Junction Railway District Control Building			
Alternative names			
Related sites (with NGRs if known) Godley Junction Station NMR 499109 Godley Junction Railway District Emergency Control Centre NGR SJ 96775 94781			
Location notes/directions The site was located in what is now a private car park along the driveway to the Thorns from Godley Hill Road.			
Current County/Unitary Authority Cheshire	Current Parish/Borough/Community Hyde	Postcode SK14 3BW	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1970–71 1/2500 OS mapping shows only the floor slab of the building was completed, in what was then part of the rail engineering depot on the north side of Godley Junction and 40m to the SE of the WWII District Emergency Control Centre it would have replaced. The site has since been redeveloped and is now occupied by a private car park.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

GOWHOLE**1. LOCATION**

Grid Reference (NGR) SK 01392 83693		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Gowhole Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The building stands within the former Gowhole marshalling yard, on the east side of the current rail line through the site.			
Current County/Unitary Authority Derbyshire	Current Parish/Borough/Community Furness Vale		Postcode SK23 7QE
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type B2	Date/s of construction 1941 Source for dates TNA files within AN2	Dates for use 1941–45
Site description and features A standard ARP Type B2 control room, measuring roughly 8m × 12m with a 3m × 3m protrusion in the centre of the northern longer side.		
Construction materials Reinforced concrete.		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

GRANTHAM**1. LOCATION**

Grid Reference (NGR) SK 91344 34850		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Grantham Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site was located where numbers 11, 15 and 17 Bradley Drive now stand, extending as far as the front walls of the houses on the opposite side of the road.		
Current County/Unitary Authority Lincolnshire	Current Parish/Borough/Community Grantham	Postcode NG31 7WN
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use	
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1965 1/2500 OS mapping shows only the floor slab of the building was completed, on the western side of a locomotive reversing loop at the southern end of Grantham rail yard. The site has since been redeveloped for housing			
Construction materials Reinforced concrete.			
Overall condition Demolished	Converted	Restored	
Threat type	Threat significance	Threat timescale	

GREENODD**1. LOCATION**

Grid Reference (NGR) SD 31482 81941		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Greenodd Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site is now under the current A590 where it runs between Sheriff Well Wood and the River Leven to the south of Greenodd.		
Current County/Unitary Authority Cumbria	Current Parish/Borough/Community Egton with Newland	Postcode LA12 7QX
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use		
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1971 1/2500 OS mapping shows only the floor slab of the building was completed, aligned north/south between the old A590 and the rail tracks some 130m south of Greenodd Station The entire site was cleared in the 1970s as part of improvements to the A590 which now runs along the former course of the railway.				
Construction materials Reinforced concrete.				
Overall condition Demolished	Converted		Restored	
Threat type	Threat significance		Threat timescale	

HOUGH GREEN**1. LOCATION**

Grid Reference (NGR) SJ 48760 86464		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Hough Green Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Hough Green Station NMR 499980		
Location notes/directions		
Current County/Unitary Authority Halton	Current Parish/Borough/Community Widnes	Postcode WA8 7WA
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use	
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on 1950–70s OS mapping. The Hough Green site was intended as the dispersed location for the Liverpool Central control room. Of reinforced concrete construction, it had a single protected doorway in each of the shorter walls. The building has been demolished at some point since the 1970s and the site redeveloped for housing.			
Construction materials Reinforced concrete.			
Overall condition Demolished	Converted		Restored
Threat type	Threat significance	Threat timescale	

HUYTON JUNCTION**1. LOCATION**

Grid Reference (NGR) SJ 45021 90757		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Huyton Junction Railway District Control Building		
Alternative names Huyton Quarry Railway District Control Building		
Related sites (with NGRs if known)		
Location notes/directions The building stood in what is now the back gardens of numbers 23–27 Hey Road, Huyton.		
Current County/Unitary Authority Merseyside	Current Parish/Borough/Community Huyton	Postcode L36 5SN
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use		
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on 1950 1/2500 OS mapping, aligned parallel with the northern branch of the rail lines and some 18m south of them. The Huyton Junction site was intended as the dispersed location of the Liverpool, Lime Street control room. Of reinforced concrete construction, it had a single protected doorway in each of the shorter walls. The building was demolished at some point after 1980 and the site redeveloped for housing.				
Construction materials Reinforced concrete.				
Overall condition Demolished	Converted		Restored	
Threat type	Threat significance		Threat timescale	

IDRIDGEHAY**1. LOCATION**

Grid Reference (NGR) SK 29027 48644		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Idridgehay Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Idridgehay Station NMR 500127		
Location notes/directions The site is some 125m south of the main Idridgehay Station building.		
Current County/Unitary Authority Derbyshire	Current Parish/Borough/Community Idridgehay and Alton	Postcode DE56 2SF
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site	Date/s of construction	Dates for use		
Protected railway control room (BR London Midland Region) Standard District Control Building Type L	1954 Source for dates TNA files within AN2			
Site description and features				
What may be the floor slab of a post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be seen on current vertical aerial imagery at the southern end of the former Idridgehay Station goods yard. A post-1999 building stands on the NW corner of the possible floor slab.				
Construction materials				
Reinforced concrete.				
Overall condition	Converted		Restored	
Threat type	Threat significance	Threat timescale		

IPSWICH**1. LOCATION**

Grid Reference (NGR) TM 15898 43764		NGR Location Point Centre of building	
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html			
Official name of site Ipswich Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Ipswich Station NMR 869300			
Location notes/directions The structure stood in the NE corner of the station yard, just to the south of the Burrell Road / Willoughby road junction. The site is now a tree-covered area to the east of a multi-storey car park, immediately behind an electricity substation.			
Current County/Unitary Authority Suffolk	Current Parish/Borough/Community Ipswich		Postcode IP2 8AH
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Pre-demolition large-scale OS maps show the structure to have been roughly 11m × 19m, similar in size to the LMS Type A1 example at Crewe. Aerial photos indicate the structure was an all-concrete purpose-built example rather than a conversion of an existing building.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

KNEBWORTH I**1. LOCATION**

Grid Reference (NGR) TL 24914 20211		NGR Location Point Centre of building	
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html			
Official name of site Knebworth Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Knebworth Station NMR 497836 Knebworth Railway District Control Building NGR TL 24961 20376			
Location notes/directions			
Current County/Unitary Authority Hertfordshire	Current Parish/Borough/Community Knebworth		Postcode SG3 6AT
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (LNER) Type A1	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45		
Site description and features Designated as the alternative location for the King's Cross division control room, the site was originally built as a rectangular single-storey brick-skinned structure, some 30m × 10m, with a reinforced concrete flat roof and a protected entrance porch at the southern end. It has since had major modifications including the addition of a further two storeys, the first of which was added during 1942 to accommodate the King's Cross District superintendent's control and clerical staff. The building is currently used by the Redeemed Christian Church Of God as Redemption House. Another example of a brick-skinned LNER Type A1 control room can be found at Shenfield, also with later additions on top.				
Construction materials Brick and reinforced concrete.				
Overall condition Good	Converted	✓	Restored	✓
Threat type	Threat significance		Threat timescale	

KNEBWORTH II**1. LOCATION**

Grid Reference (NGR) TL 24961 20376		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Knebworth Railway District Control Building		
Alternative names		
Related sites (with NG Knebworth Station NMR 497836 Knebworth Station NMR 497836 Knebworth Railway Divisional Emergency Control Room NGR TL 24914 20211		
Location notes/directions The building stood in what is now the location of (even) numbers 24–32 Kerr Close, Knebworth.		
Current County/Unitary Authority Hertfordshire	Current Parish/Borough/Community Knebworth	Postcode SG3 6AB
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR Eastern Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use		
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on 1970–90s large-scale OS mapping in the former goods yard to the immediate NE of Knebworth Station, on the east side of the rail line. Of reinforced concrete construction, it had a single protected doorway in each of the shorter walls. This particular example superseded the WWII Division Emergency Control Room to the immediate south of the main station building. The building was demolished at some point in the mid 1990s and the site redeveloped for housing.				
Construction materials Reinforced concrete.				
Overall condition Demolished	Converted		Restored	
Threat type	Threat significance		Threat timescale	

LANGLEY MILL**1. LOCATION**

Grid Reference (NGR) SK 44950 46874		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Langley Mill Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site is 130m south of the A608 Station Road, in open space at the foot of the embankment below platform 1 at Langley Mill Station.		
Current County/Unitary Authority Derbyshire (Notts border)	Current Parish/Borough/Community Aldercar and Langley Mill	Postcode NG16 4BP
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use		
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1962 1/2500 OS mapping shows only the floor slab of the building was completed, this had been removed or buried by 1990.				
Construction materials Reinforced concrete.				
Overall condition	Converted		Restored	
Threat type	Threat significance		Threat timescale	

MARKET WEIGHTON**1. LOCATION**

Grid Reference (NGR) SE 87809 41935		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Market Weighton Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Market Weighton Station NMR 498362		
Location notes/directions The site is within a small park directly to the east of numbers 1 & 3 Station Road, Market Weighton and 15m north-east of the telephone exchange building.		
Current County/Unitary Authority Yorkshire (East)	Current Parish/Borough/Community Market Weighton	Postcode YO43 3AX
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR North Eastern Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use	
Site description and features The outline of a post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on the 1974 1/2500 OS map, aligned north/south along its longer axis. It is unclear whether this represents a completed building or just the footings. Market Weighton was intended as the dispersed location for the Hull control room. The site had been completely cleared by 1990 and no visible trace of the structure remains.			
Construction materials Reinforced concrete.			
Overall condition Demolished	Converted		Restored
Threat type	Threat significance	Threat timescale	

MELTON MOWBRAY**1. LOCATION**

Grid Reference (NGR) SK 75427 18773		NGR Location Point Centre of building	
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html			
Official name of site Melton Mowbray Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Melton Mowbray Midland Station NMR 509080			
Location notes/directions The building stood on the north side of the rail line 30m east of Burton End Bridge.			
Current County/Unitary Authority Leicestershire	Current Parish/Borough/Community Melton Mowbray		Postcode LE13 1GH
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type B2	Date/s of construction 1941 Source for dates TNA files within AN2	Dates for use 1941–45
Site description and features A standard ARP Type B2 control room aligned NNW along its longer axis, measuring roughly 8m × 12m with a 3m × 3m protrusion in the centre of the eastern longer side, can be identified in post-war 1/2500 OS mapping. The site has since been cleared and is currently a grassed area between the road and a factory		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

METHERINGHAM**1. LOCATION**

Grid Reference (NGR) TF 07619 61446		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Metheringham Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Blankney & Metheringham Station NMR 506982		
Location notes/directions The structure stood just inside the entrance to the station yard on the right-hand side		
Current County/Unitary Authority Lincolnshire	Current Parish/Borough/Community Metheringham	Postcode LN4 3JH
NMR No. (if site known) 1524679	HER/SMR No. 62001	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features <p>"This building was built at the start of the Second World War as an Emergency Railway Control Building for the region, to become active in the event of the Control Room in Lincoln being taken out of action by bombing. The outer walls are red brick and with a flat reinforced concrete roof. The original windows survive, with heavy steel surrounds. The steel shutters to close the openings have gone but their hinges remain as well as the stays for fixing them back in their open position. A new entrance has been created on the west elevation, with double doors, to facilitate its more recent use as a railway store. A small extension to the north side has also been removed."</p> <p>(Squires, S., 2010, <i>Notification of Design Former Railway Control Building, Station Yard, Station Road, Metheringham</i>. English Heritage Listing File, Heritage Protection Adviser, 12th May 2010)</p> <p>The building was demolished during 2010–11 during the refurbishment of the station.</p>		
Construction materials Brick and reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

MILNROW**1. LOCATION**

Grid Reference (NGR) SD 92715 12290		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Milnrow Railway District Control Building			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The site was on the open ground to the immediate NW of Rebecca Court, Harbour Lane, Milnrow.			
Current County/Unitary Authority Lancashire	Current Parish/Borough/Community Milnrow		Postcode OL16 4HF
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1955–56 1/2500 OS mapping shows the completed building standing to the south of Milnrow Station, on the opposite side of the tracks. The building has since been demolished and the site is now a grassed area between Harbour Lane and the A640		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

NORWICH**1. LOCATION**

Grid Reference (NGR) TG 23842 08355		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Norwich Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The structure stood against the south wall of the station forecourt			
Current County/Unitary Authority Norfolk	Current Parish/Borough/Community Norwich		Postcode NR1 1EF
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Post-war large-scale OS maps indicate a rectangular building roughly 6m × 18m built against the outside of the southern retaining wall of the station forecourt. A prefabricated concrete pitched-roof building can be seen built on top of this, level with the forecourt, in post-war photographs. Both parts of the structure have been demolished as part of recent redevelopment works to the station and surrounding area.		
Construction materials .		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

ORPINGTON**1. LOCATION**

Grid Reference (NGR) TQ 45464 66048		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Orpington Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Orpington Station NMR 509561			
Location notes/directions The building is alongside the eastern wall of a former engine shed, to the north of Orpington Station.			
Current County/Unitary Authority Greater London	Current Parish/Borough/Community Orpington		Postcode BR6 0SX
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–60+
Site description and features The structure is partially buried, and stands alongside the southern half of a former engine shed. Entry is via two blast-protected stairwells. For a detailed site report see: http://www.subbrit.org.uk/sb-sites/sites/o/orpington_railway_bunker/index.shtml		
Construction materials Reinforced concrete.		
Overall condition Poor	Converted	Restored
Threat type	Threat significance	Threat timescale

PATRICROFT**1. LOCATION**

Grid Reference (NGR) SJ 76805 99062		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Patricroft Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The structure was located where the M602 now passes close to Corbel Way, Eccles. Originally it stood on the north side of a large railway junction and sidings area.			
Current County/Unitary Authority Greater Manchester		Current Parish/Borough/Community Eccles	
		Postcode M30 9GH	
NMR No. (if site known)		HER/SMR No.	
		Heritage Designation	

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LMS)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45+		
Site description and features A rectangular structure aligned roughly NW along its long axis is visible on 1950s large scale OS maps, measuring approximately 10m × 15m. The structure is not shown on the 1938 edition.				
Construction materials Reinforced concrete.				
Overall condition Demolished	Converted		Restored	
Threat type	Threat significance		Threat timescale	

PETERBOROUGH**1. LOCATION**

Grid Reference (NGR) TL 18432 99280		NGR Location Point Centre of building	
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html			
Official name of site Peterborough Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known) Peterborough Railway Control Centre NMR 1476703			
Location notes/directions Western end of the Spitals Bridge, on the north side of the road.			
Current County/Unitary Authority Cambridgeshire	Current Parish/Borough/Community Peterborough		Postcode PE3 6EP
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LNER) Type B2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features 1947 aerial photos show a large rectangular structure in the corner of a former allotments field, similar in size and shape to other known hardened control rooms. (http://www.britainfromabove.org.uk/image/eaw009524) The field was the site of a British Rail Hostel in the post-war years, a 1962 photograph of the site shows an arched concrete entranceway at the top of the railway cutting, leading downwards towards the site of the structure seen in the 1947 image. (http://upload.wikimedia.org/wikipedia/commons/9/90/Peterborough_North_geograph-2178990.jpg) The entire site was redeveloped for housing at some time between 1999 and 2006.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

PORTSMOUTH**1. LOCATION**

Grid Reference (NGR) SU 64405 00285		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Portsmouth Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Portsmouth and Southsea Station NMR 508938			
Location notes/directions The structure stood against the inside of the goods yard wall directly opposite No. 3 Durham Street.			
Current County/Unitary Authority Hampshire	Current Parish/Borough/Community Portsmouth		Postcode PO1 1NA
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A semi-buried emergency control room, measuring some 10m × 20m, can be identified against the eastern wall of the station goods yard in a 1946 vertical aerial photo. (http://upload.wikimedia.org/wikipedia/commons/6/64/Portsmouth_and_southsea_railway_station.JPG) The structure has since been removed.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

REDHILL**1. LOCATION**

Grid Reference (NGR) TQ 28088 50317		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Redhill Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Orpington Station NMR 509561			
Location notes/directions The building is 250m south of the main station building, to the immediate west of the houses on Fenton Close.			
Current County/Unitary Authority Surrey	Current Parish/Borough/Community Redhill		Postcode RH1 4BF
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–60+
Site description and features The structure is partially buried, and stands at the southern end of a former goods shed. For a detailed site report see http://www.subbrit.org.uk/rsg/sites/r/redhill_railway/index.html		
Construction materials Reinforced concrete.		
Overall condition Poor	Converted	Restored
Threat type	Threat significance	Threat timescale

ROTHERHAM**1. LOCATION**

Grid Reference (NGR) SK 41768 92559		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Rotherham Masborough Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions 160m south of Coronation Bridge, on the west side of the north / south rail lines within the railway junction. 90m west of the Millmoor stadium.		
Current County/Unitary Authority Yorkshire (South)	Current Parish/Borough/Community Rotherham	Postcode S61 1AZ
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Vertical aerial imagery shows a rectangular concrete structure roughly 10m × 15m, aligned E/W along its long axis. Oblique aerial images show a doorway in the south wall, at the eastern end. The structure appears similar to the example at Carlisle, the position of the visible doorway and the overall dimensions of the structure matches the LMS design drawings for a Type A2 Emergency Control Room.		
Construction materials Reinforced concrete.		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

ROWSLEY**1. LOCATION**

Grid Reference (NGR) SK 26138 64768		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Rowsley Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The building stood 40m south of the A6 / Harrison Way junction, in trees on the east side of the A6.			
Current County/Unitary Authority Derbyshire	Current Parish/Borough/Community Northwood and Tinkersley		Postcode DE4 2LF
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type B2	Date/s of construction 1941 Source for dates TNA files within AN2	Dates for use 1941–45
Site description and features A standard ARP Type B2 control room aligned ENE along its longer axis, measuring roughly 8m × 12m with a 3m × 3m protrusion in the centre of the northern longer side, can be identified at the southern end of the former Rowsley Sidings site in post-war 1/2500 OS mapping. The site has since been cleared and is currently a tree-covered area between the road and a recycling centre.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

SALTLEY**1. LOCATION**

Grid Reference (NGR) SP 09229 87698		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Saltley Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions On the east side of the main line within the EWS rail yard, 30m south of the bridge over Duddesdon Mill Road.			
Current County/Unitary Authority Birmingham	Current Parish/Borough/Community Saltley		Postcode B8 1AP / B7 4SZ
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–99
Site description and features Vertical aerial imagery and post-war 1/2500 OS mapping show a rectangular concrete building roughly 10m × 15m, aligned N/S along its long axis. The dimensions of the building match the LMS design drawings for a Type A2 Emergency Control Room. A 1950s track diagram for the Saltley rail yard identifies the building as the Wartime Control, and that it was in use as a store at that time.(http://www.warwickshirerailways.com/lms/mr/saltley/shed/mrsalt656.jpg) The building was demolished in the 1999–2001 period and the site is currently a car park within the EWS Motive Power Depot.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

SHENFIELD I**1. LOCATION**

Grid Reference (NGR) TQ 61836 95739		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Shenfield Railway Divisional Emergency Control Room		
Alternative names		
Related sites (with NGRs if known) Shenfield Railway District Control Building NGR TQ 61873 95790		
Location notes/directions The site is the southernmost building within the Whitegates Business Centre.		
Current County/Unitary Authority Essex	Current Parish/Borough/Community Shenfield	Postcode CM15 8QF
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (LNER) Type A1	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–68
Site description and features Designated as the alternative location for the Liverpool Street division control room, the site was originally built as a rectangular single-storey brick clad structure, some 30m × 10m, with a reinforced concrete flat roof. Window openings along the longer walls were protected by metal shutters, which are still in situ. As with the similar brick-skinned LNER Type A1 example at Knebworth, the building has been altered considerably over time but the original structure is still clearly visible. A second storey has been added to the roof, and the building has been extended some 20m to the north-east. A smaller two-storey extension has also been added to the south-west end. The site of an uncompleted 1950s British Railways District Control Building stands to the immediate north-east.		
Construction materials Brick and reinforced concrete. Steel blast shutters over window openings.		
Overall condition Good	Converted	✓ Restored
Threat type	Threat significance	Threat timescale

SHENFIELD II**1. LOCATION**

Grid Reference (NGR) TQ 61873 95790		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Shenfield Railway District Control Building		
Alternative names		
Related sites (with NGRs if known) Shenfield Railway Divisional Emergency Control Room NGR TQ 61836 95739		
Location notes/directions The building is the northern of the two larger buildings in the Whitegates Business Centre.		
Current County/Unitary Authority Essex	Current Parish/Borough/Community Shenfield	Postcode CM15 8QF
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR Eastern Region))	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use Not brought into use
Site description and features The site of post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 40m as compared to the usual 11m × 29m (94.5' × 35.6'). The outline of the footings can be seen on 1960s 1/2500 OS mapping. Shenfield was the intended dispersed site for the London Stratford control room, and was to have superseded the WWII Division Emergency Control Room to its immediate south-west. Construction was however abandoned before completion, with only the floor slab being laid. A more recent structure has since been built on top using the existing slab as its foundation.		
Construction materials Reinforced concrete.		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

SOUTHAMPTON**1. LOCATION**

Grid Reference (NGR) SU 42590 10956		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site Southampton Railway Divisional Emergency Control Room		
Alternative names Southampton Docks Control Room Southampton Docks Telephone Exchange		
Related sites (with NGRs if known) Southampton Terminus Station NMR 230535		
Location notes/directions The building stood 60m south of Southampton Terminus Station, on the west side of Neptune Way. The area was cleared and redeveloped circa 2000–2001, Charter House now stands on the site.		
Current County/Unitary Authority Hampshire	Current Parish/Borough/Community Southampton	Postcode SO14 3FY
NMR No. (if site known) 1411391	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1941 Source for dates TNA files within AN2	Dates for use 1941–60+
Site description and features <p>"The Dock telephone exchange was in the basement of the 19th century brick 'N' Warehouse, but this was destroyed in an air raid of 1941. The 'N' warehouse basement was encased within a new building. Construction work was by the Southern Railway Company, the owners of the docks. The new structure was used as a general control room as well as a telephone exchange. It continued to be used after the Second World War, and was even extended in the 1960s. Associated British Ports retain the original construction plans, which they allowed us to copy for the record. The Collections Management Centre of Southampton City Council have a set of photographs taken during its construction. These clearly show the methods of construction used.</p> <p>The building was constructed within the basement of the bombed warehouse, and re-used its brick walls. However, this was covered with a domed structure made of three layers of 3 foot thick reinforced concrete with sand and "quarry dust" sandwiched between them. The roof was designed to have a total thickness of 12 feet. The original layout of the internal space was very well preserved, with some of the original plant still present, including a huge Lister diesel generator which provided electricity and powered the ventilation system. It must have been placed in position before the bunker roof and stairs were built. Its log book and service history were still beside it, and it had run for just over 300 hours. A map of the 1950s docks was still stuck to the wall in one room.</p> <p>There was some re-arrangement of part of the building when the Docks Control room was removed. Further alterations were made, apparently in the 1950s, to provide an emergency exit. This was perhaps in response to a perceived Cold War threat.</p>		

<p>A full report can be consulted in the Special Collections section of Southampton Central Library in the Civic Centre."(Ref: SOU 1027) (https://www.southampton.gov.uk/s-leisure/artsh heritage/history/archaeology/archaeology-unit/sitesbyarea/bargate-ward/bunker.aspx)</p>			
<p>Construction materials Brick and reinforced concrete</p>			
<p>Overall condition Demolished</p>	<p>Converted</p>		<p>Restored</p>
<p>Threat type</p>	<p>Threat significance</p>	<p>Threat timescale</p>	

ST ALBANS**1. LOCATION**

Grid Reference (NGR) TL 15638 06662		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site St Albans Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site is now occupied by Davy House at the southern end of Charrington Place, St Albans.		
Current County/Unitary Authority Hertfordshire	Current Parish/Borough/Community St Albans	Postcode AL1 3FL
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), intended as the dispersed location for the London King's Cross control room. 1963–65 1/2500 OS mapping shows only the floor slab of the building was completed, orientated parallel to the main railway line, at the foot of the embankment at the southern end of the station goods yard. The site has since been cleared and a new building, Davy House, stands on the spot.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

STOCKSFIELD**1. LOCATION**

Grid Reference (NGR) NZ 05586 61491		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Stocksfield Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site of the building is now occupied by numbers 10–12 Hall Farm Close, Stocksfield.		
Current County/Unitary Authority Northumberland	Current Parish/Borough/Community Stocksfield	Postcode NE43 7NL
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR North Eastern Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use	
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on 1962–63 1/2500 OS mapping, aligned parallel with the rail lines and some 11m to the south of them. Stocksfield was the intended dispersed site for the Newcastle control room. What appear to be some of the internal walls are shown on the 1960s map which may indicate construction was either not completed or that demolition had already begun by that time. The building had been completely removed and the site redeveloped for housing by 1980.			
Construction materials Reinforced concrete.			
Overall condition Demolished	Converted		Restored
Threat type	Threat significance	Threat timescale	

TAMWORTH**1. LOCATION**

Grid Reference (NGR) SK 21350 04500		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Tamworth Railway District Control Building		
Alternative names		
Related sites (with NGRs if known)		
Location notes/directions The site is at the foot of the embankment at the north end of the Platform 4 of Tamworth Station, to the immediate NE of the lift tower.		
Current County/Unitary Authority Staffordshire	Current Parish/Borough/Community Tamworth	Postcode B79 7JT
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Protected railway control room (BR London Midland Region) Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use		
Site description and features A post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'). 1958 1/2500 OS mapping shows only the floor slab of the building was completed, which still survives in the undergrowth at the foot of the railway embankment.				
Construction materials Reinforced concrete.				
Overall condition Poor	Converted		Restored	
Threat type	Threat significance		Threat timescale	

TOTON**1. LOCATION**

Grid Reference (NGR) SK 48693 35001		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Toton Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Toton Sidings NMR 509147		
Location notes/directions The building stands within the Toton rail yard, to the west of the main line.		
Current County/Unitary Authority Nottinghamshire	Current Parish/Borough/Community Beeston	Postcode NG10 1HA
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type A2	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features A standard LMS ARP Type A2 control room, measuring roughly 10m × 15m, standing between the North Yard and Meadow Sidings in the Toton rail yard.		
Construction materials Reinforced concrete.		
Overall condition Fair	Converted	Restored
Threat type	Threat significance	Threat timescale

WELLINGBOROUGH**1. LOCATION**

Grid Reference (NGR) SP 90451 69412		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Wellingborough Railway District Emergency Control Centre			
Alternative names			
Related sites (with NGRs if known)			
Location notes/directions The structure is located on the east side of the tracks to the north of the A510 Finedon Road bridge, in the trees at the end of a works compound alongside the Ise Valley Industrial Estate.			
Current County/Unitary Authority Northamptonshire	Current Parish/Borough/Community Wellingborough		Postcode NN8 4BJ
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LMS)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–60+
Site description and features A rectangular structure is visible on aerial imagery aligned roughly NNW along its long axis, measuring approximately 11m × 6m.		
Construction materials		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

WEST HARTLEPOOL**1. LOCATION**

Grid Reference (NGR) NZ 51529 32751		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site West Hartlepool Railway District Emergency Control Room		
Alternative names		
Related sites (with NGRs if known) Railway Control Centre NMR 956613 Hartlepool Goods Station NMR 498039		
Location notes/directions The site is currently open ground at the southern end of Mayflower Close, Hartlepool.		
Current County/Unitary Authority Durham	Current Parish/Borough/Community Hartlepool	Postcode TS24 0XY
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features The 1939 edition 1/2500 scale OS map shows a structure, measuring roughly 10m × 15m, situated to the NE of the main station building, on the north side of Dock Street. A 1947 oblique aerial photo shows this structure has been surrounded by an embankment, and has what appears to be four brick intake and exhaust stacks, two each at the east and west ends. (http://www.britainfromabove.org.uk/image/eaw003193) The 1955 edition of the OS map shows the embankment partially covers Dock Street. The entire Old Town area has been subject to extensive redevelopment since the station closed, and no trace appears to remain on the ground.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

WESTHOUSES**1. LOCATION**

Grid Reference (NGR) SK 42312 58578		NGR Location Point Centre of building			
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html					
Official name of site Westhouses Railway District Emergency Control Centre					
Alternative names					
Related sites (with NGRs if known)					
Location notes/directions The building stood at the north end of Midland Terrace in Westhouses village, in a paddock between the B6025 Tibshelf Road and the railway embankment, 30m north of the last house on Midland Terrace and 125m south of the bridge.					
Current County/Unitary Authority Derbyshire		Current Parish/Borough/Community Blackwell		Postcode DE55 5AB	
NMR No. (if site known)		HER/SMR No.		Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Centre (LMS) Type B2	Date/s of construction 1941 Source for dates TNA files within AN2	Dates for use 1941–45
Site description and features A standard LMS ARP Type B2 control room, measuring roughly 8m × 12m with a 3m × 3m protrusion in the centre of the northern longer side, can be seen on post-war large-scale OS maps. The building was removed at some point after 1985.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

WILLESDEN JUNCTION

1. LOCATION

Grid Reference (NGR) TQ 21869 82918		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Willesden Junction Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Willesden Junction Station NMR 509525		
Location notes/directions The building stood on what is now the traffic turning circle at the east end of Station Approach.		
Current County/Unitary Authority Greater London	Current Parish/Borough/Community Harlesden	Postcode NW10 4UY
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LMS)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features Vertical 1940s aerial imagery shows a rectangular concrete structure roughly 10m × 15m of similar appearance to known wartime-build LMS Railway District Emergency Control Centres. A partial image of the structure in 1981 is at www.flickr.com/photos/82097736@N00/8395907372 Large-scale OS mapping and other reports indicate it was demolished as recently as the late 1990s, its last use was apparently as a paint store for the rail operator.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

WILMSLOW**1. LOCATION**

Grid Reference (NGR) SJ 85106 81254		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Wilmslow Railway District Control Building			
Alternative names			
Related sites (with NGRs if known) Wilmslow Station NMR 500455			
Location notes/directions The site of the building is now occupied by a car dealership at the junction of Bollins Walk and the A34.			
Current County/Unitary Authority Cheshire	Current Parish/Borough/Community Wilmslow		Postcode SK9 1AE
NMR No. (if site known)	HER/SMR No.		Heritage Designation

2. SITE OBSERVATIONS

Type of site Possible protected railway control room (BR London Midland Region) Possible Standard District Control Building Type L	Date/s of construction 1954 Source for dates TNA files within AN2	Dates for use
Site description and features What appears to be a post-war Standard District Control Building Type L built to drawing 1384/53, measuring roughly 11m × 29m (94.5' × 35.6'), can be identified on 1966–67 1/2500 OS mapping, aligned parallel with the rail lines at the foot of the embankment directly below the north end of the easternmost platform. Wilmslow was intended as the dispersed site for the Manchester, London Road control room. The site has been cleared and a car dealership now stands on the spot.		
Construction materials Reinforced concrete.		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

WOKING**1. LOCATION**

Grid Reference (NGR) TQ 00857 58783		NGR Location Point Centre of building	
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html			
Official name of site Woking Railway Divisional Emergency Control Room			
Alternative names			
Related sites (with NGRs if known) Woking Station NMR 501634			
Location notes/directions The building stands at the SW end of the Oriental Lane car park along the southern side of the rail lines some 200m NE of the main station building. A stairway up to the main station area leads along the SE side of the building.			
Current County/Unitary Authority Surrey	Current Parish/Borough/Community Woking	Postcode GU22 7AW	
NMR No. (if site known)	HER/SMR No.	Heritage Designation	

2. SITE OBSERVATIONS

Type of site Railway Divisional Emergency Control Room (Southern Railway)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–60+
Site description and features The building is partially buried and appears to measure some 20m × 20m, with a blast-protected entrance on the NE face. Until recent years two pitched-roof buildings had been added on the top, these appear to have now been removed except for their footings. Online reports indicate there is a further entrance, now blocked, and that the interior, although substantially complete with regards to original equipment and fittings, has suffered from fire damage. (http://www.28dayslater.co.uk/forums/underground-sites/84586-southern-railway-traffic-control-centre-bunker-woking-surrey-oct-2013-a.html)		
Construction materials Reinforced concrete.		
Overall condition Poor	Converted	Restored
Threat type	Threat significance	Threat timescale

WORKINGTON**1. LOCATION**

Grid Reference (NGR) NX 99532 28878		NGR Location Point Centre of building
NGR Source http://www.fieldenmaps.info/cconv/cconv_gb.html		
Official name of site Workington Railway District Emergency Control Centre		
Alternative names		
Related sites (with NGRs if known) Workington Station NMR 499604		
Location notes/directions The structure stood between the main station building and Belle Isle Place.		
Current County/Unitary Authority Cumbria	Current Parish/Borough/Community Workington	Postcode CA14 2XE
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Possible Railway District Emergency Control Centre (LMS)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–60+
Site description and features Post-war large-scale OS maps indicate a rectangular building roughly 6m × 12m aligned parallel to the station frontage, where locals recall a large "air raid shelter" stood. The site is currently occupied by a modern approach road to the station entrance.		
Construction materials		
Overall condition Demolished	Converted	Restored
Threat type	Threat significance	Threat timescale

YORK**1. LOCATION**

Grid Reference (NGR) SE 59745 51720		NGR Location Point Centre of building
NGR Source http://www.fielddenmaps.info/cconv/cconv_gb.html		
Official name of site York Railway District Emergency Control Room		
Alternative names		
Related sites (with NGRs if known) York Old Station NMR 56649 York City Wall NMR 58149 Scheduled Ancient Monument No.1004910		
Location notes/directions The site is underground, buried within the city wall rampart opposite the present railway station.		
Current County/Unitary Authority Yorkshire (North)	Current Parish/Borough/Community York	Postcode YO1 6GA
NMR No. (if site known)	HER/SMR No.	Heritage Designation

2. SITE OBSERVATIONS

Type of site Railway District Emergency Control Room (LNER) Possible Divisional Emergency Control Room (LNER)	Date/s of construction 1939 Source for dates TNA files within AN2	Dates for use 1939–45
Site description and features The structure is entirely underground, built into the earthen rampart of the city wall opposite the railway station. As such, it may be classed as being within the boundary of Scheduled Ancient Monument No.1004910 (York City Walls), but its inclusion would need to be confirmed. Access is via doorways in a retaining wall on the eastern race of the rampart, formerly facing railway sidings serving the now-closed York Old Station. It is possible that the structure served as both the York District Emergency Control Room and the Divisional Emergency Control Room for the LNER North Eastern Division Headquarters at York, as no separate site for the latter has yet been identified.		
Construction materials		
Overall condition	Converted	Restored
Threat type	Threat significance	Threat timescale

PRIMARY SOURCES

The National Archives

AIR1/512/16/3/62	Defence of London against Air-Raids, 1918
AIR1/554/16/15/45	Rough Notes: Home Defence Reports on Air Raids, London, 1914–16
AIR1/721/46/4	Memorandum: Air-Raid Warning Organisation in Gt. Britain November, 1918
AIR1/1284/204/11/18	Suggestions of Defence of London against Air Attacks, 1915–16
AN1/3	Railway Executive Committee Minutes 1619-2475, 1914–16
AN1/31	(same as AIR1/554/16/15/45)
AN1/54	Railway Executive Committee Instructions 1-484, 1914–16
AN2/8	1938 Emergency Arrangements containing AN2/8/1 to 30
AN2/37	ARP Expenditure containing AN2/37/1 to 11
AN2/41	ARP Expenditure containing AN2/41/1 to 18
AN2/42	ARP Expenditure containing AN2/42/1 to 9
AN2/43	ARP Expenditure containing AN2/43/1 to 15
AN2/49	Appointment of Railway Executive Committee containing AN2/49/1 to 2
AN2/50	Appointment of Railway Executive Committee containing AN2/50/1 to 3
AN2/55	REC Organisation containing AN2/55/1 to 5
AN2/63	ARP Expenditure Admin & Control Rooms contains AN2/63/1 to 9
AN2/67	1938 Emergency Arrangements ARP Expenditure contains AN2/67/1 to 6
AN2/68	Emergency Arrangements contains AN2/68/1 to 7
AN2/69	Emergency Arrangements contains AN2/68/1 to 10
AN2/70	ARP Expenditure, Purchase of Stores in Bulk contains AN2/70/1 to 2
AN2/71	ARP Expenditure, Purchase of Stores in Bulk contains AN2/71/1 to 30
AN2/72	ARP Admin & Control Rooms Part 2 contains AN2/72/1 to 6
AN2/75	ARP Expenditure Protection of Essential Staff contains AN2/75/1 to 5
AN2/138	Disposal of ARP Equipment 1944-1946 contains AN2/138/1 to 21
AN2/201/1	Instructions to Managers contains AN2/201/1 to 6
AN2/632	Instructions to General Managers, 1939–40
AN2/633	REC Instructions to General Managers, 1940–41
AN3/84	Control of Railways, 1939
AN97/24	Civil Defence Railways Committee Minutes 1-79
AN13/2529	Civil Defence, 1949–1953
AN13/2557	Civil Defence Estimates, 1950–1952
AN13/2558	Civil Defence Estimates, 1953–1954
AN13/2560	Future of Railway Works, 1950–1953
AN13/2561	British Transport Commission Decentralisation Arrangements, 1950–52
AN94/240	Chester District, 1953
AN120/131	BR Civil Defence, 1961–67
RAIL 1135/219	York District LNER Control Centre Instructions to Staff, 1937
RAIL 1135/220	York District LNER Control Centre Instructions to Staff, 1940
RAIL 1135/222	Sunderland District LNER Control Centre Instructions to Staff, 1939
RAIL 1172/2341	Provision of Rations for Emergency HQ, 1941

Report and Survey of Railway Control Rooms

RAIL 1172/2052	Movement Control, 1939
RAIL 1172/2068	Reservation of Control Staff, 1941–42
RAIL 390/1841	Control Arrangements – Re-organisation of York District Control, 1940
RAIL 418/197	Report on the LMS Operating Department during Second World War, 1943
RAIL 418/198	Report on the LMS Operating Department during Second World War, 1944
RAIL 418/199	Report on the LMS Operating Department during Second World War, 1945
RAIL 418/200	Report on the LMS Operating Department during Second World War, 1946
RAIL 418/201	Report on the LMS Operating Department during Second World War, 1939–43
HO 338/17	Effects of Air Attack on Building Structures: Design of Control Centres, 1949–57
HO45/18800	Civil Defence Protection of the Railways, 1935–41
WO 32/5290	Defence of the Realm Act, 1912–14
WO 32/5259	Regulations for the Railways & Movement of Troops, 1914–19

National Railway Museum Archive – Civil Defence

(Selection of files relating to emergency control rooms and air-raid shelters)

CIVE/15/1	Retention & Location of Air-Raid Shelters, 1948–64
CIVE/15/2/2	Special Shelters and Sidings – King’s Cross District, 1948–54
CIVE/15/2/3	Special Shelters and Sidings – Stratford District, 1946–55
CIVE/15/2/4	Special Shelters and Sidings – Peterborough District, 1948–54
CIVE 15/2/5	Special Shelters and Sidings Leeds District, 1948–49
CIVE 15/2/6	Special Shelters and Sidings – Cambridge District, 1948–54
CIVE/29/1	Emergency Control Shelters, 1953–61
CIVE/29/2	Bawtry Emergency Control Centre, 1954–61
CIVE/29/3	Dore & Totley Emergency Control Centre, 1954–58
CIVE/29/4	Shenfield Emergency Control Centre, 1954–60
CIVE/29/5	Newmarket Emergency Control Shelter, 1954–56
CIVE/29/6	Knebworth Emergency Control Shelter, 1954–61
CIVE/29/7	Grantham Emergency Control Centre, 1954–57
CIVE/29/8	Wymondham Emergency Control Centre, 1954–55
CIVE/29/9	Ely Emergency Control Shelter, 1954–55
CIVE/29/10	Emergency Control Shelter Plans, 1955
CIVE/32/12	Master List of Shelters & Emergency Control Shelters & Signal Boxes, 1955
CIVE/40/1	Air-Raid Shelter Inspections Norwich District, 1955–56
CIVE/41/1	Civil Defence Schemes – Bawtry, 1952
CIV/41/2	Civil Defence Schemes – Watton at Stone, 1952
CIV/41/3	Civil Defence Schemes – Hitchin, 1949
CIVE/41/4	Civil Defence Schemes – Staveley, 1951
CIVE/41/5	Civil Defence Schemes – Hertford East, 1952
CIVE/41/20	Papers, 1958–62

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